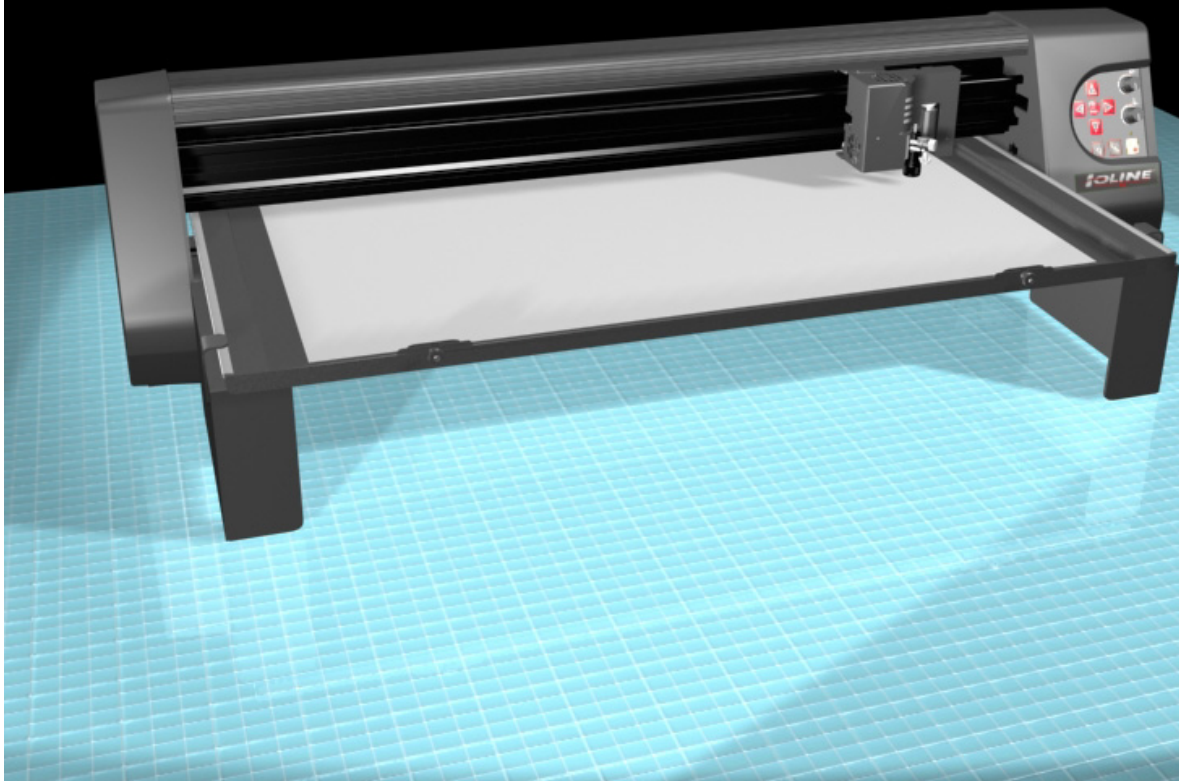




# 350HF

High Force Cutter



# Service Manual



This is the first edition of the 350HF System Service Manual. Subsequent updates or revisions will be announced on this page.

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**P/N : 108248**  
**REV 0**  
June, 2003

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## Table of Contents

|                                                       |           |
|-------------------------------------------------------|-----------|
| <b>Chapter 1 Introduction and Overview .....</b>      | <b>7</b>  |
| <b>How To Use This Manual .....</b>                   | <b>8</b>  |
| <b>Safety .....</b>                                   | <b>9</b>  |
| Warnings And Cautions .....                           | 9         |
| Basic Safety Guidelines .....                         | 9         |
| <b>Product Overview .....</b>                         | <b>10</b> |
| Specifications .....                                  | 11        |
| How The 350HF System Works .....                      | 11        |
| Table Movement: .....                                 | 12        |
| Blade Movement: .....                                 | 13        |
| <b>Limit Of Liability Statement .....</b>             | <b>14</b> |
| Ioline Warranty Policy .....                          | 14        |
| <b>Serial Number Identification .....</b>             | <b>15</b> |
| <b>Glossary .....</b>                                 | <b>15</b> |
| <b>Chapter 2 Nomenclature .....</b>                   | <b>16</b> |
| <b>Chapter 3 Setup &amp; Operation .....</b>          | <b>23</b> |
| <b>Keypad Controls .....</b>                          | <b>24</b> |
| Arrow Keys .....                                      | 24        |
| Set Origin .....                                      | 25        |
| Cutting Speed .....                                   | 25        |
| Blade Force .....                                     | 25        |
| Start/Stop .....                                      | 25        |
| Power LED .....                                       | 25        |
| Test Cut .....                                        | 26        |
| Repeat .....                                          | 26        |
| <b>Software Installation .....</b>                    | <b>27</b> |
| Installing the 301, and Control Center Software ..... | 27        |
| Windows 95/98/ME installation .....                   | 28        |
| Windows NT/2000/XP Installation .....                 | 28        |
| <b>Installing the Hardlock Key .....</b>              | <b>29</b> |
| <b>Control Center Software .....</b>                  | <b>30</b> |
| Screen Options .....                                  | 30        |
| Measurement Units .....                               | 31        |
| Acceleration .....                                    | 31        |
| Up/Down Delays .....                                  | 31        |
| HPGL Default .....                                    | 31        |
| Send Settings to the 350HF .....                      | 31        |
| Force .....                                           | 32        |
| Panel Size .....                                      | 32        |
| Scale .....                                           | 32        |
| Blade Overcut .....                                   | 32        |
| <b>Menu Bar Items .....</b>                           | <b>33</b> |
| File .....                                            | 33        |
| Send Cut/Plot File .....                              | 33        |

|                                                                |           |
|----------------------------------------------------------------|-----------|
| Open Settings File .....                                       | 33        |
| Save Settings As... .....                                      | 33        |
| <b>Setup .....</b>                                             | <b>33</b> |
| Plotter Setup .....                                            | 34        |
| Com Port Setup .....                                           | 34        |
| <b>Display .....</b>                                           | <b>34</b> |
| Plotter Settings .....                                         | 34        |
| Factory Defaults .....                                         | 34        |
| ROM Version .....                                              | 34        |
| Memory Buffer .....                                            | 34        |
| Blade Holder Status .....                                      | 34        |
| <b>Options .....</b>                                           | <b>35</b> |
| Filtering .....                                                | 35        |
| HPGL Setting... .....                                          | 35        |
| Install New Firmware version .....                             | 35        |
| <b>Calibration .....</b>                                       | <b>36</b> |
| Calibrate Plotter .....                                        | 36        |
| <b>Test .....</b>                                              | <b>36</b> |
| Serial Test .....                                              | 36        |
| Computer Port Test. ....                                       | 36        |
| Plotter Port Test. ....                                        | 36        |
| <b>Help .....</b>                                              | <b>37</b> |
| Contents .....                                                 | 37        |
| About .....                                                    | 37        |
| <b>Chapter 4 Troubleshooting and Testing .....</b>             | <b>38</b> |
| <b>Basic Operational Difficulties .....</b>                    | <b>39</b> |
| Common Problems .....                                          | 39        |
| <b>Error Messages .....</b>                                    | <b>40</b> |
| Software Errors: .....                                         | 40        |
| L.E.D Codes .....                                              | 41        |
| No Power When The 350HF System is Turned On .....              | 42        |
| The 350HF Won't Respond to the Computer .....                  | 42        |
| <b>Communication Problems .....</b>                            | <b>42</b> |
| Serial Communication Test: .....                               | 43        |
| Testing the 350HF Plotter Port: .....                          | 43        |
| Testing the Computer Port: .....                               | 43        |
| <b>Cutting Quality Problems .....</b>                          | <b>44</b> |
| <b>Mechanical, and Electronic Diagnostic Process .....</b>     | <b>45</b> |
| Expanded LED Codes .....                                       | 46        |
| <b>External Inspection .....</b>                               | <b>47</b> |
| Required Tools: .....                                          | 47        |
| Inspecting the Outside of the Unit: .....                      | 47        |
| <b>Internal Cabling and Connection Inspection .....</b>        | <b>48</b> |
| Tools Required: .....                                          | 48        |
| Initial Internal Inspection: .....                             | 48        |
| <b>Testing the Power Supply .....</b>                          | <b>49</b> |
| Tools Required: .....                                          | 49        |
| Inspecting the Fuse and Output Terminals: .....                | 49        |
| Testing the Power Supply Output Voltage: .....                 | 49        |
| Reference Information for the Power Supply Test Fixture: ..... | 50        |

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>Testing the Logic Board .....</b>                            | <b>51</b> |
| Tools Required:.....                                            | 51        |
| Testing the FETs (Transistors): .....                           | 51        |
| Testing and Replacing the Other Logic Components .....          | 52        |
| <b>Testing the Motors.....</b>                                  | <b>52</b> |
| Tools Required:.....                                            | 52        |
| Motor Inspection: .....                                         | 52        |
| Likely Modes of Motor Failure: .....                            | 52        |
| Tray (X Axis) Motor Replacement: .....                          | 53        |
| Carriage (Y Axis) Transmission .....                            | 53        |
| Carriage (Y Axis) Motor Replacement: .....                      | 53        |
| Testing the New Motor: .....                                    | 53        |
| <b>Contacting Ioline Customer Service .....</b>                 | <b>54</b> |
| Diagnostic Record .....                                         | 54        |
| <b>Re-Packing the 350HF .....</b>                               | <b>55</b> |
| <b>Chapter 5 Repair and Maintenance.....</b>                    | <b>56</b> |
| <b>Cleaning And Regular Maintenance .....</b>                   | <b>58</b> |
| <b>General Disassembly Procedures .....</b>                     | <b>59</b> |
| Removing the End Covers .....                                   | 59        |
| Removing the Bottom Cover for Internal Access .....             | 61        |
| <b>Y Axis Subsystem .....</b>                                   | <b>63</b> |
| CARRIAGE REPLACEMENT .....                                      | 63        |
| Replacing the Carriage Flex Cable: .....                        | 68        |
| Y-Axis Transmission Replacement: .....                          | 69        |
| Y Axis Motor Replacement: .....                                 | 71        |
| <b>X Axis Subsystem .....</b>                                   | <b>75</b> |
| X Axis Motor Replacement: .....                                 | 75        |
| Table Assembly Replacement .....                                | 77        |
| <b>Power Supply .....</b>                                       | <b>80</b> |
| Power Supply Replacement .....                                  | 80        |
| Rear Panel Replacement .....                                    | 82        |
| <b>Electronic Sub-Systems .....</b>                             | <b>84</b> |
| Main Logic Board Replacement .....                              | 84        |
| Resetting the Factory Defaults .....                            | 85        |
| Keypad Replacement .....                                        | 85        |
| Installing new Firmware .....                                   | 86        |
| <b>Chapter 6 Drawings, and Bulletins .....</b>                  | <b>87</b> |
| Belt Tensioner ("Y" Axis) .....                                 | 88        |
| Belt Tensioner (Bill of materials) .....                        | 89        |
| "Y" Axis Transmission.....                                      | 90        |
| "Y" axis Transmission (Bill of Materials).....                  | 91        |
| Table Assembly .....                                            | 92        |
| Table Assembly (Bill of Materials) .....                        | 93        |
| Tray Belt Idler Assy (Right Side) .....                         | 94        |
| Tray Belt Idler Assembly - Right side (Bill of Materials) ..... | 95        |
| Tray Belt Idler Assy (Left Side) .....                          | 96        |
| Tray Belt Idler Assembly - Left Side (Bill of Materials) .....  | 97        |
| Carriage Assembly .....                                         | 98        |

|                                                             |            |
|-------------------------------------------------------------|------------|
| Carriage Assembly (Bill of Materials) .....                 | 99         |
| Shaft Assembly .....                                        | 100        |
| Shaft Assembly (Bill of Materials) .....                    | 101        |
| 350HF Chassis Drawing .....                                 | 102        |
| System 350HF - Chassis Assembly (Bill of Materials) .....   | 103        |
| System 350HF Wrapping Procedure .....                       | 104        |
| System 350HF - Wrapping Procedure (Bill of Materials) ..... | 105        |
| System 350HF Boxing procedure .....                         | 106        |
| System 350HF - Boxing Procedure (Bill of Materials) .....   | 107        |
| <b>Service Bulletins .....</b>                              | <b>108</b> |
| Installation Error/301 Software .....                       | 108        |
| Creating Barudin Files/301 Software .....                   | 109        |
| Run Time Error Codes/301 Software .....                     | 109        |
| Stitches Overlap to Wrong Side / 301 Software.....          | 109        |
| How to "KISS-CUT" .....                                     | 110        |



## **Chapter 1 Introduction and Overview**

Chapter One provides an overview of the Service Manual and important background information about the 350HF System Cutter. The following information is covered here:

- How to Use This Manual
- Safety
- Product Overview
- Limit of Liability Statement
- Ioline Warranty Policy
- Serial Number Identification
- Glossary

### How To Use This Manual

This Service Manual explains most aspects of the Ioline 350HF System Cutter including product specifications, installation directions, and testing and repair procedures.

**Chapter 1** of the manual provides introductory information and general specifications.

**Chapter 2** provides descriptive drawings showing part names for the 350HF System cutter. This section is intended to supplement the *350HF System User's Guide*.

**Chapter 3** familiarizes the user with how the 350HF System operates and how to use the software to maximum benefit. This section also supplements the *350HF System User's Guide*.

**Chapter 4** is a troubleshooting and testing guide.

**Chapter 5** provides details for repair and maintenance of the 350HF System.

**Chapter 6** sections contain technical drawings and reference material.

## **Safety**

### **Warnings And Cautions**

Please read the safety guidelines that are explained below before beginning the testing and replacement procedures explained in chapters 5 and 6.

#### **WARNING**

*Warnings call attention to safety procedures that must be followed in order to avoid potential personal injury.*



*Cautions call attention to procedures that are required to maximize equipment performance.*

### **Basic Safety Guidelines**

Comply with the following safety guidelines in order to prevent electrical shock and other injuries.

- Only qualified service personnel should attempt any of the subsystem testing or replacement procedures that are described in this manual.
- Unless otherwise noted, all subsystem testing or replacement procedures must be performed with the 350HF System turned off and the power cord removed from the rear panel. This will avoid the possibility of electrical shock.
- Before beginning any subsystem testing or replacement procedure, make sure that the 350HF System is on a flat, stable, clean, and dry surface.
- Keep fingers, hair, and clothing well clear of the 350HF System whenever moving parts are being tested.
- When working on electronic components use a grounding wrist strap to prevent electrostatic damage. If a wrist strap is not available Ioline can provide one.

## **Product Overview**

The Ioline 350HF System Cutter can handle many different plotting, and cutting operations up to 30 inches wide and 18 inches long. Three industry standard plotter languages (HPGL 7475, HPGL 7596, and DMPL) are supported. It is most commonly used in conjunction with the Ioline 301 software for cutting applique patterns, and producing embroidery stitch files for those appliques to be output to the most common embroidery machines. The 350HF System also comes with Control Center software that allows adjustment of a variety of cutter settings from the computer.



**Figure 1-1.** Ioline 350HF System Cutter.

### Specifications

|                                    |                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Plotting Speed</i>              | 24 in/second                                                                                                                                                                                                                                                |
| <i>Max Plotting Acceleration</i>   | 1.0 g                                                                                                                                                                                                                                                       |
| <i>Blade Force</i>                 | 10g to 700g                                                                                                                                                                                                                                                 |
| <i>Cutting Area</i>                | 18" x 30" (.463m x .768m)                                                                                                                                                                                                                                   |
| <i>Scale</i>                       | 1% to 999%                                                                                                                                                                                                                                                  |
| <i>Pens / Tools</i>                | Accommodates Markers, Pens, Pencils to 22.2mm (.875"). Minimum size: .30" (7.6mm)                                                                                                                                                                           |
| <i>Power Requirement</i>           | 90-264 VAC, 47-66 Hz, 150 Watts                                                                                                                                                                                                                             |
| <i>Overall Physical Dimensions</i> | Height: 12" (.30m)<br>Width: 24" (.61m)<br>Depth: 45" (1.14m)                                                                                                                                                                                               |
| <i>Shipping Weight</i>             | 124 lbs (56 Kgs)                                                                                                                                                                                                                                            |
| <i>Environmental Range</i>         | Temperature: 0-35 C (32-95 F) Relative Humidity: 30% 85% (Non-Condensing)                                                                                                                                                                                   |
| <i>Hardware Interface</i>          | Standard RS-232C Serial interface:9600, Baud rate, No parity, 8 Data bits, 1 stop bit Hardware or Software (XON / XOFF) Handshaking, DB-25S connector, requires DB-25P mating connector. Parallel communication: IEEE-1284 (Note: Some units may not have a |
| <i>Command Languages</i>           | DM/PL, HP/GL: HP-7475 & HP-7596                                                                                                                                                                                                                             |

### How The 350HF System Works

The 350HF System combines media and Blade motion to create vector cuts. Vector files are sent to the cutter via a serial connection with a computer or file server. When a file is sent to the cutter the electronic logic system translates the vectors into instructions for the X Axis (material motion) and Y Axis (blade motion) motors.

**Table Movement:**

Tray motion is accomplished by mounting the material to be cut on an adhesive sheet that is mounted to a removable tray. The tray is then fastened to a fixed table on the machine. The X-Axis transmission rotates a shaft which in turn rotates a gear assembly. Timing belts on the right and left underside of the fixed table wraps around the gear assembly which in turn moves the fixed table in and out.

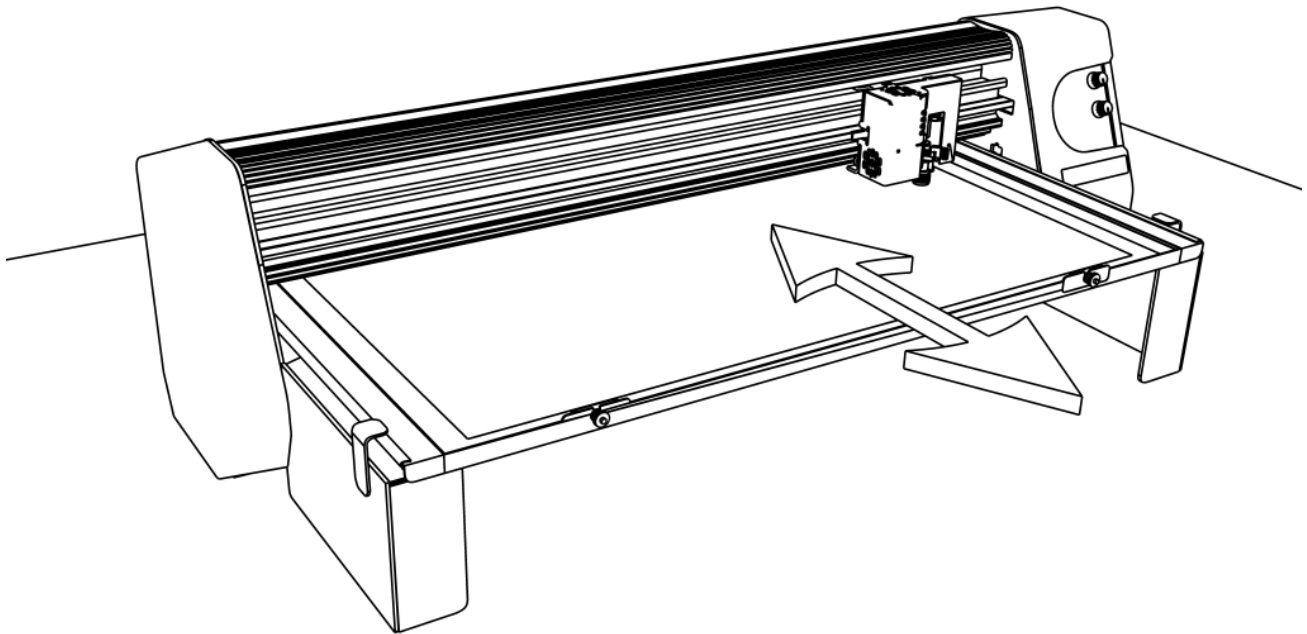


**Fig. 1-2** Table (X Axis) Motion

**Blade Movement:**

The Y-Axis transmission powers a timing belt that transports a V wheel carriage along the Y-Axis traverse extrusion. The blade is attached to the carriage and is made to contact the material by actuating a voice coil. When not cutting the blade is held above the paper by spring action.

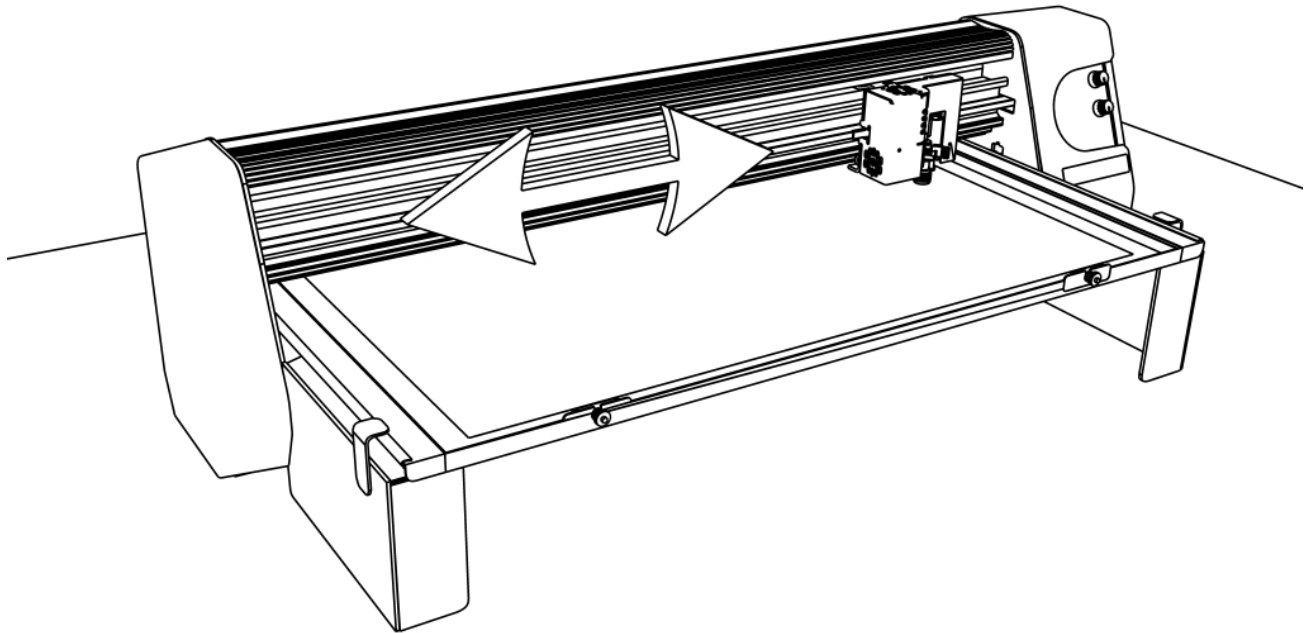


**Fig. 1-3** Carriage (Y Axis) Motion

### Limit Of Liability Statement

It is the responsibility of the operator to monitor the performance of the 350HF system and maintain it in proper working condition by following the operating and regular maintenance instructions. It is also the responsibility of the operator to follow all safety precautions and warnings that are described in this manual. Ioline is not responsible for injuries that may occur as a result of unsafe operating procedures or for degraded performances as a result of failure to maintain the 350HF System.

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### Ioline Warranty Policy

Ioline Corporation provides a 12 month parts and labor warranty on all new equipment and 90 days on repaired units, unless specifically noted otherwise. Every unit is recorded by serial number when it leaves the factory. The warranty period is based on the serial number of the unit and extends from the date of manufacture up to 12 months, plus an extra 3 months for shelf life. Making the total warranty period 15 months from the date of manufacture. *See Fig. 1-4 on page 15 for an explanation of how to read the serial number of the machine.*

For warranty service, the end user must work through their dealer. Ioline Customer Service is available to assist Authorized Dealers in the performance of their equipment support.

## Serial Number Identification

Identification of Ioline Corporation products is accomplished by use of a serial number located on the back of the plotter (See fig. 2-2 on Pg 17). You can determine the model and date of manufacture by interpreting this serial number.

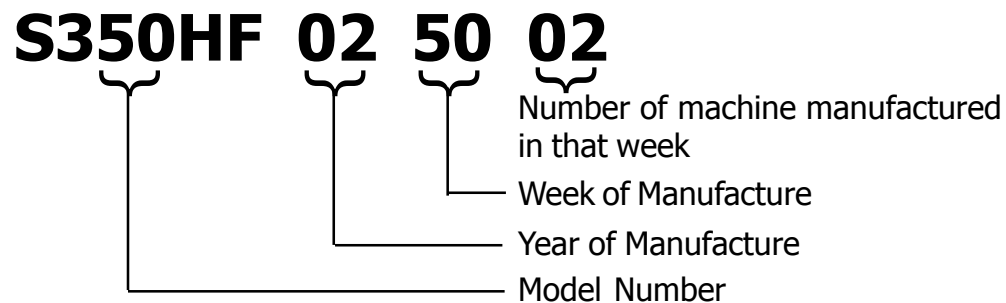


**Figure 1-4.** Ioline Serial Number Indications.

## Glossary

|                      |                                                                                                                       |
|----------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1. BOM               | Bill(s) of materials for an assembly                                                                                  |
| 2. Bottom Pan        | Metal housing protecting the underside of the cutter.                                                                 |
| 3. Carriage          | The component that holds the blade. It travels along the Y-Axis on the traverse assembly.                             |
| 4. Keypad            | Where the user controls simple plotter functions. Carriage and media motion is accessible from here during stop mode. |
| 5. Traverse Assembly | Structure that supports and guides the carriage.                                                                      |
| 6. X-Axis            | Direction of tray moving in and out of the machine.                                                                   |
| 7. Y-Axis            | Direction of the blade motion. Usually associated with the carriage.                                                  |



## **Chapter 2 Nomenclature**

## Nomenclature

(Defining the different parts of the 350HF System)

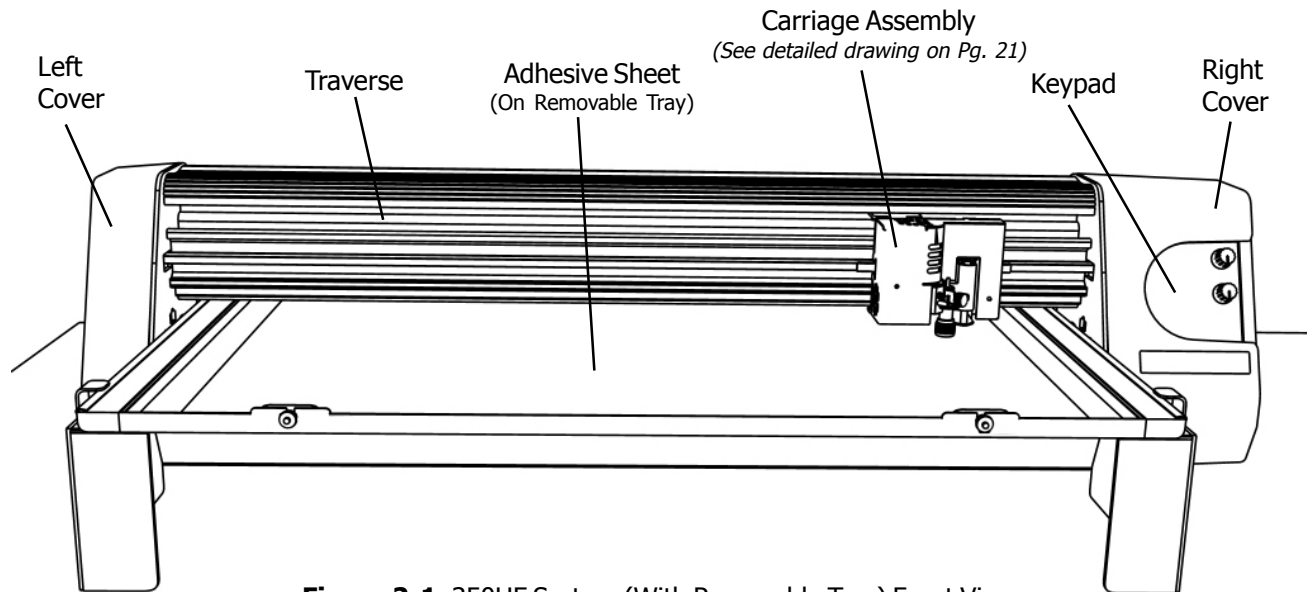


**Figure 2-1.** 350HF System (With Removable Tray) Front View

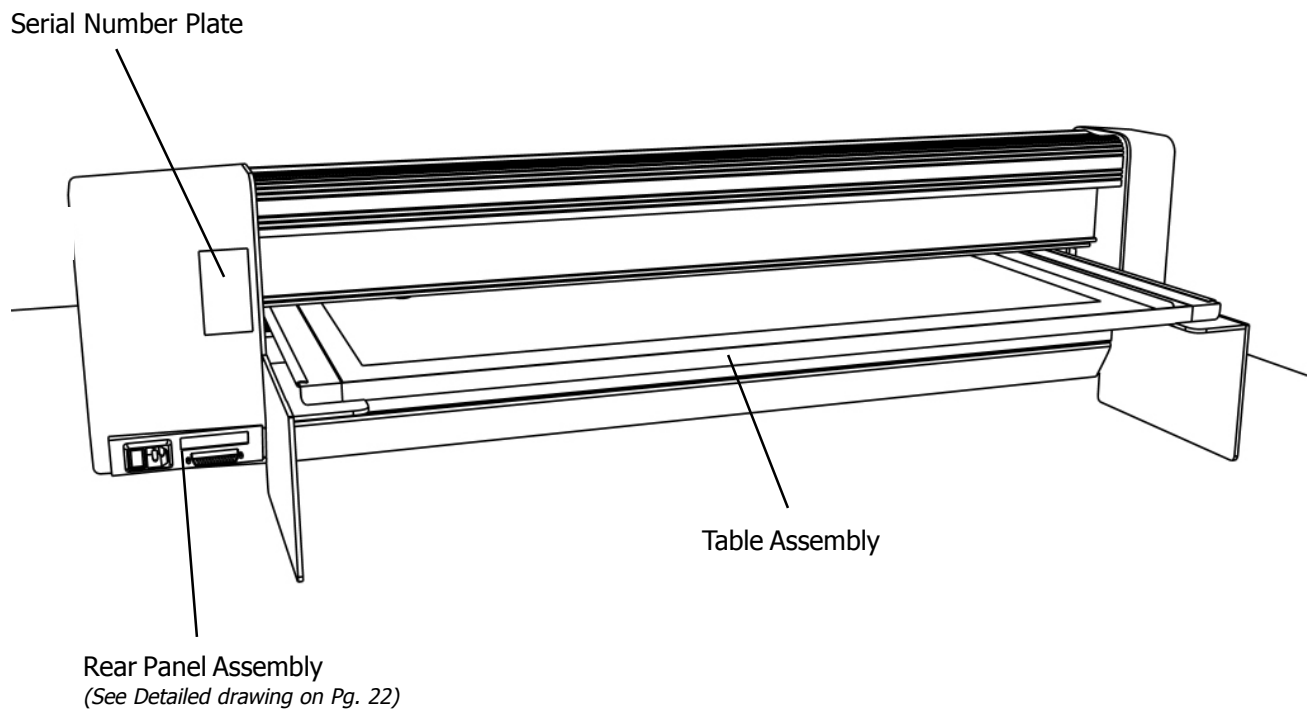


**Figure 2-2.** 350HF System (Without Removable Tray) Rear View

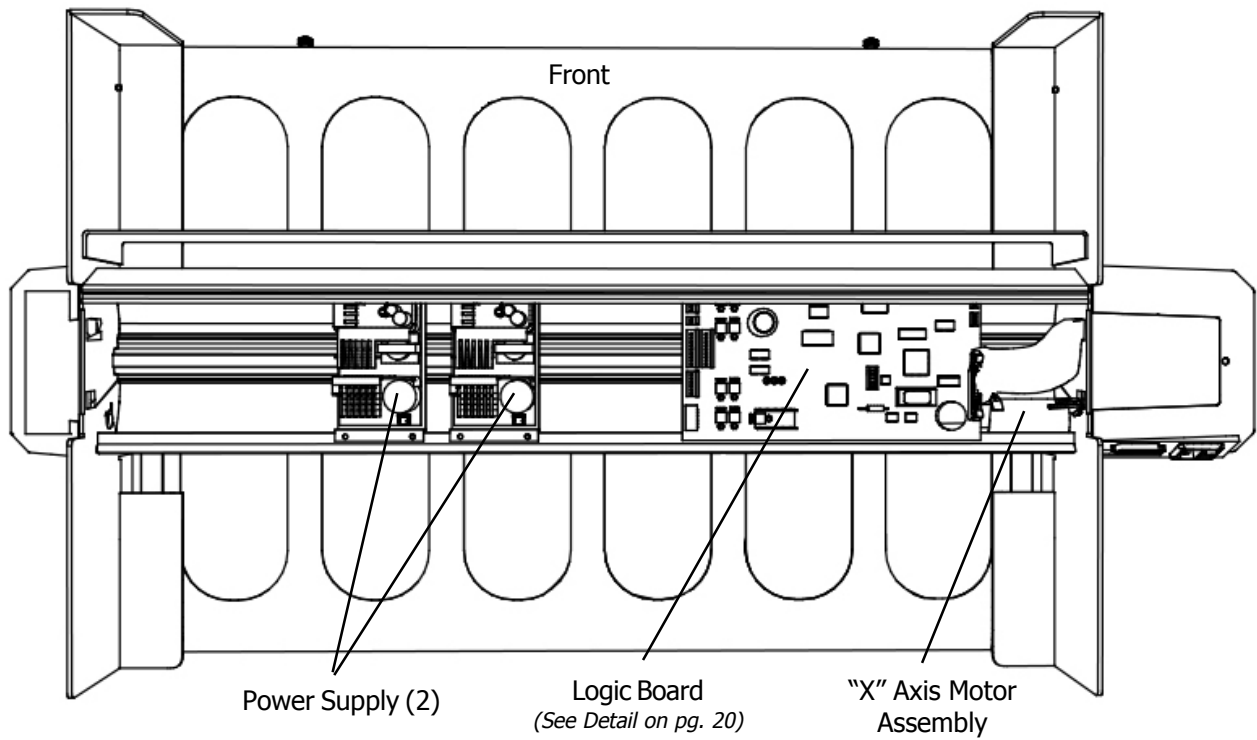


**Fig 2-3** 350HF Cutter (Bottom View with bottom cover removed)

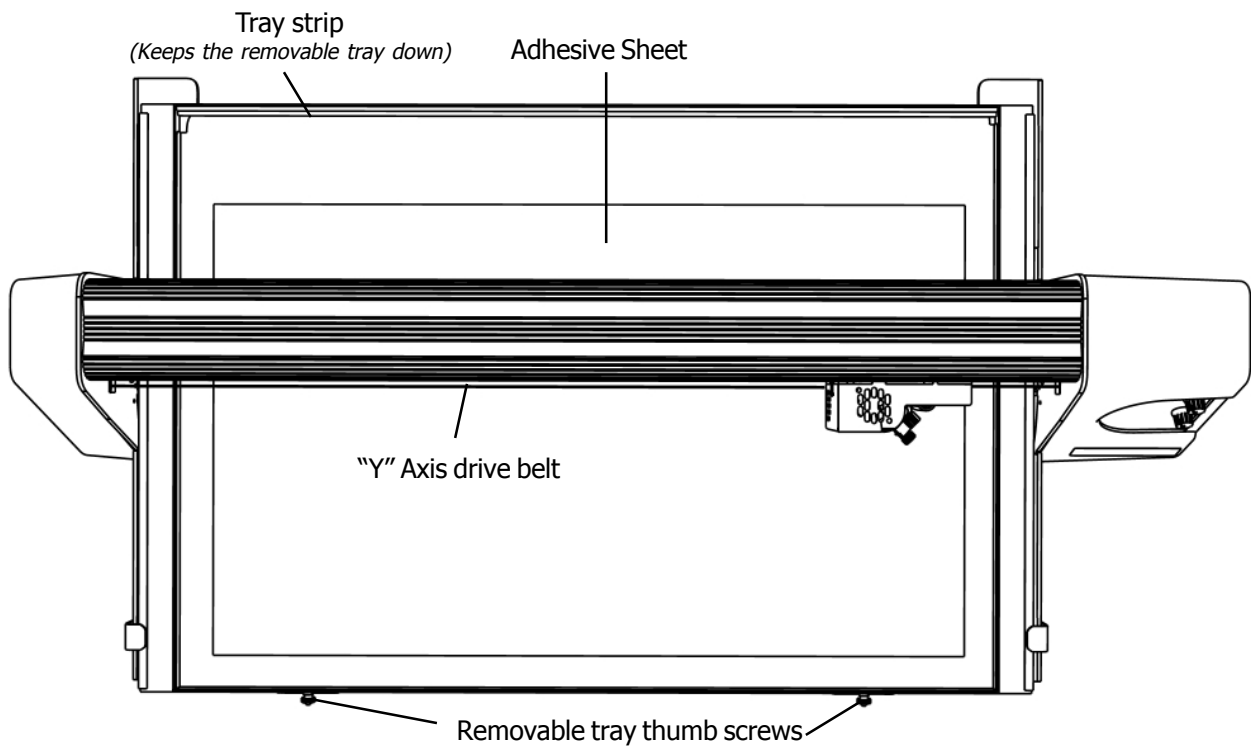


**Fig 2-4** 350HF Cutter (Top View)

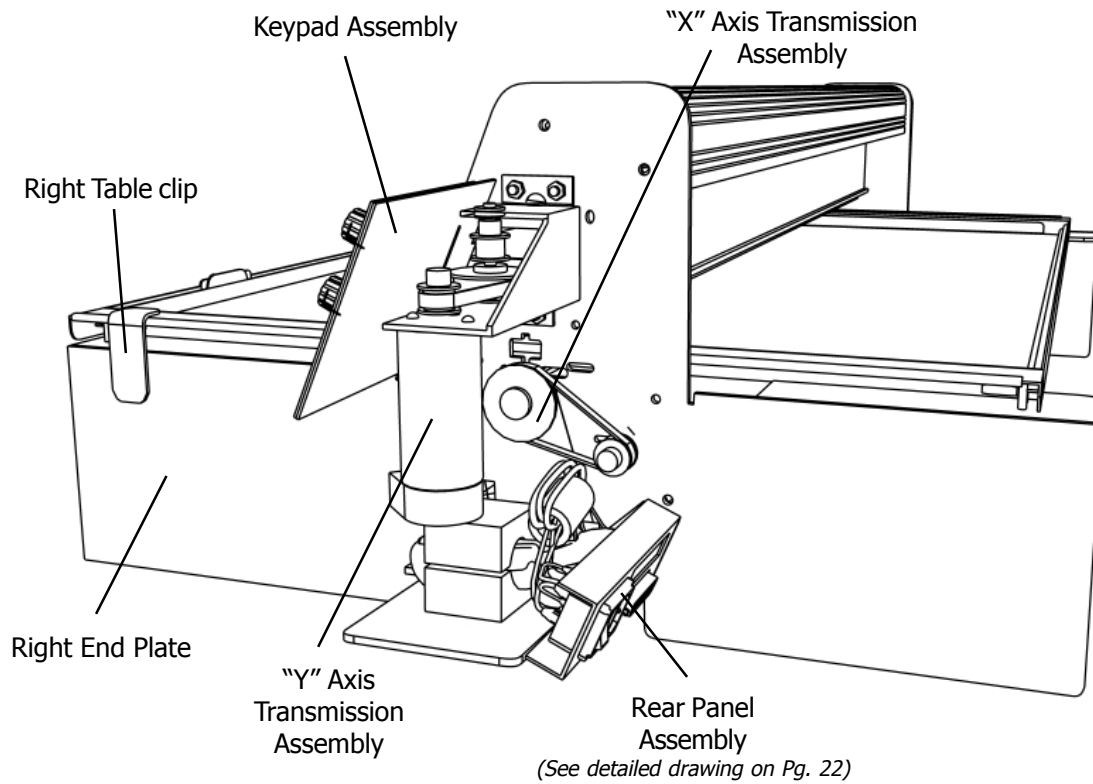


**Fig. 2-5** 350HF Cutter (Right view with cover removed)

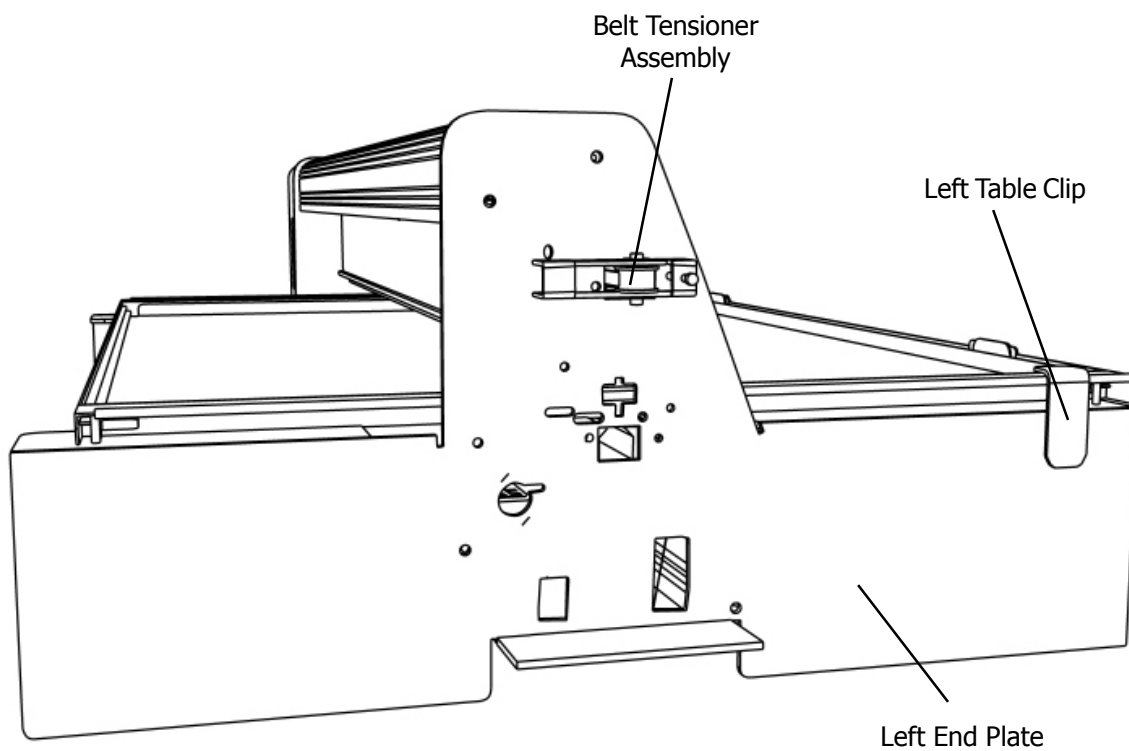


**Fig. 2-6** 350HF Cutter (Left view with cover removed)

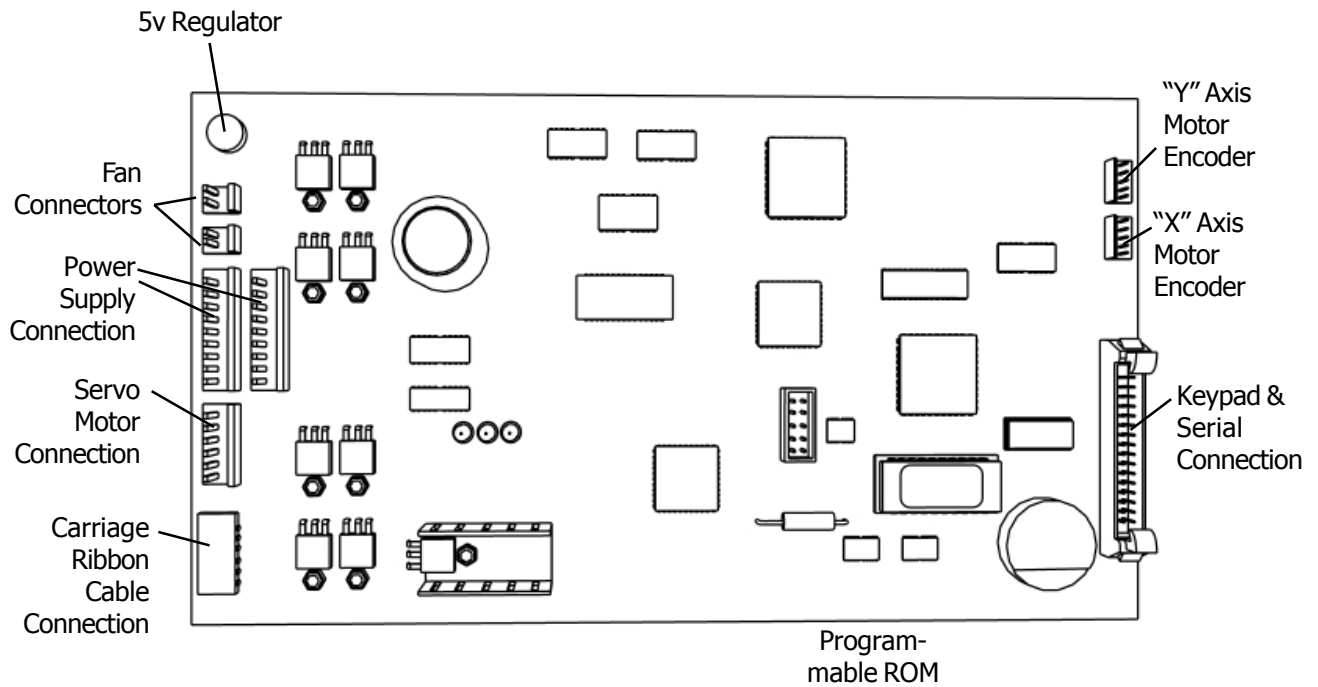


**Fig. 2-7** Logic Board

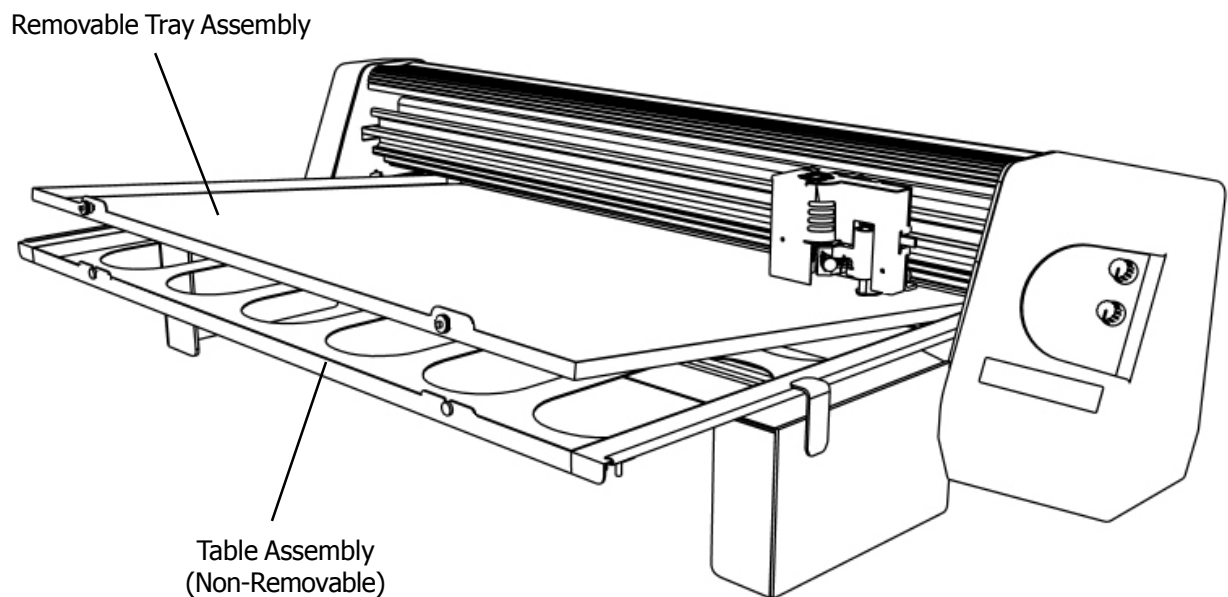


**Fig. 2-8** Tray & Table Assembly

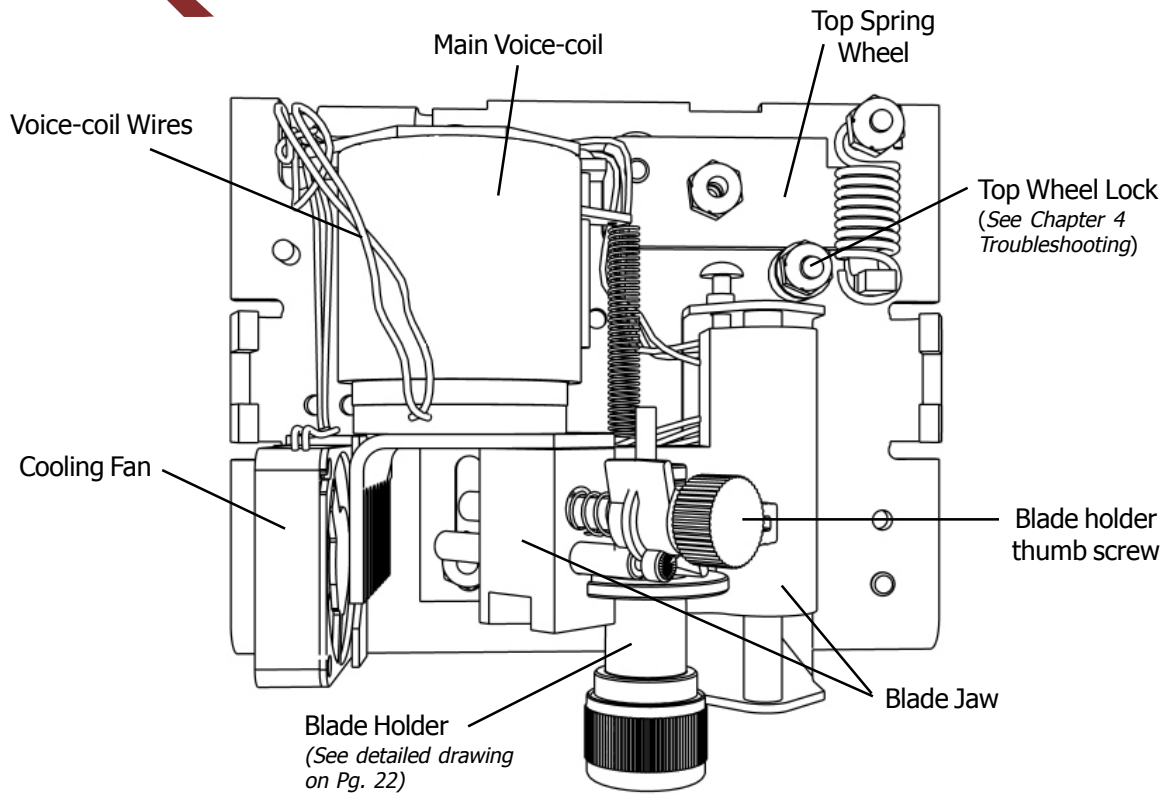


**Fig. 2-9** Carriage Assembly (With Blade installed)

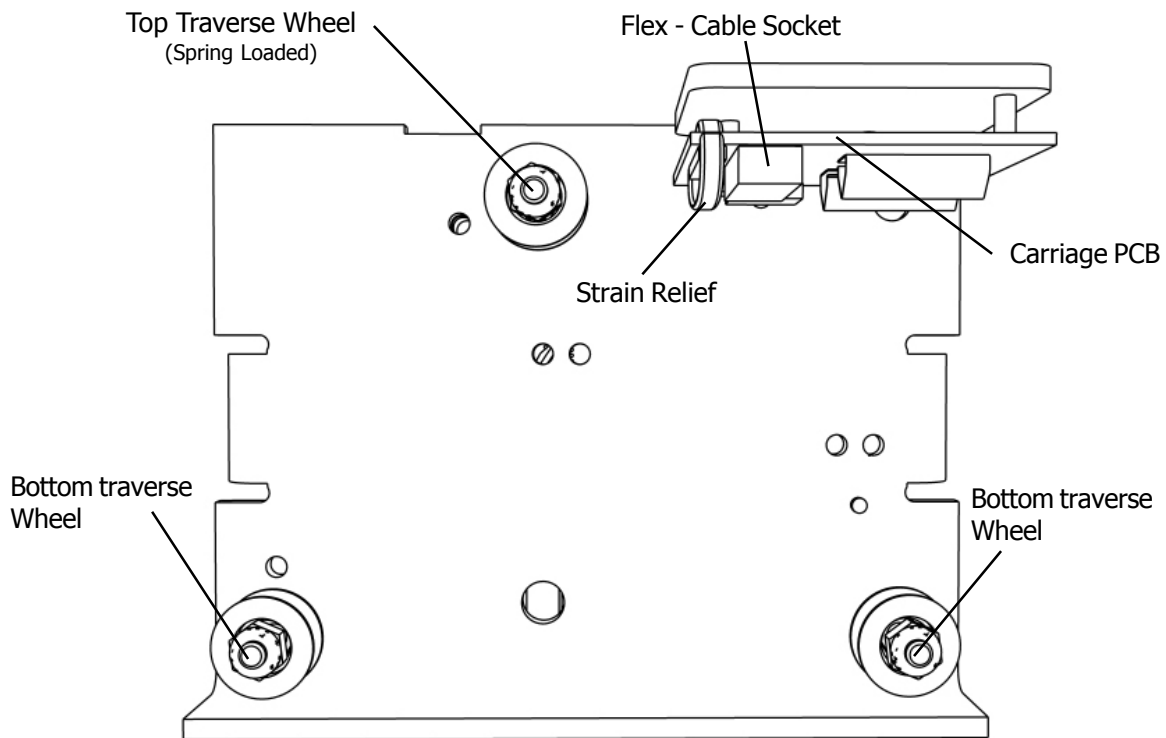


**Fig. 2-10** Carriage Assembly (Rear View)

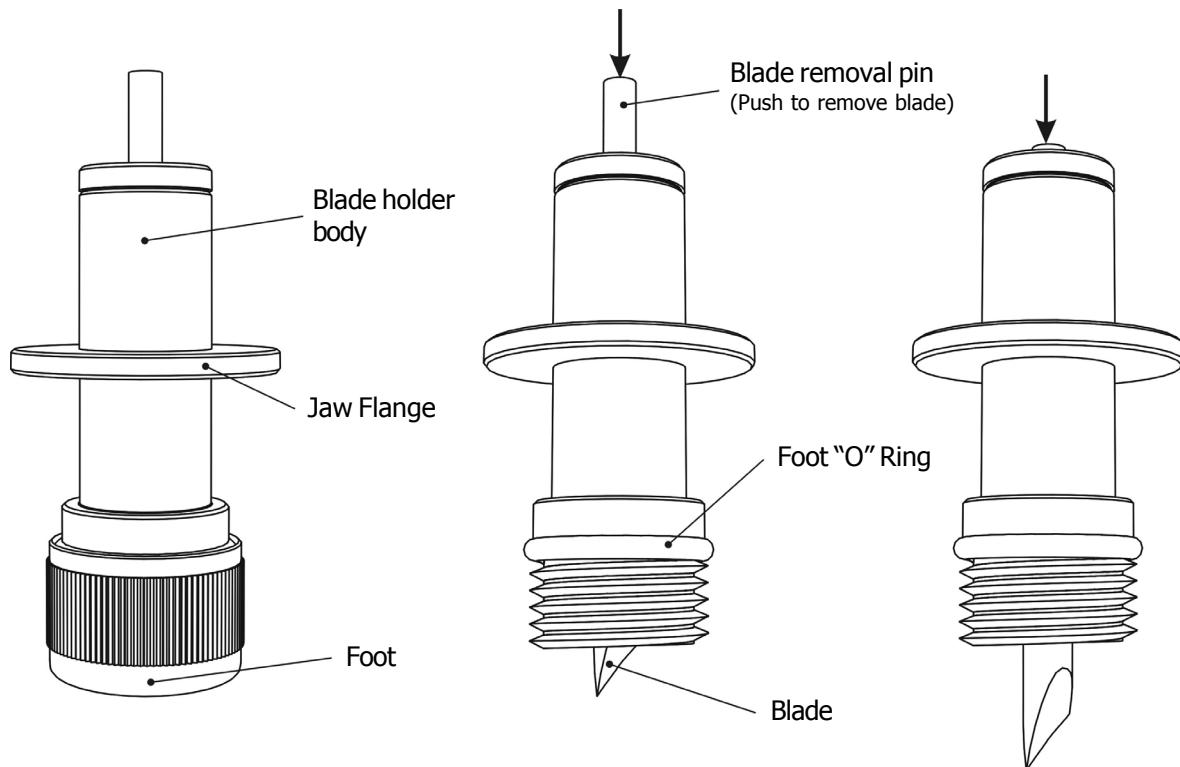


**Fig. 2-11** Blade Holder Assy 1) With foot 2) With foot removed 3) Removing blade

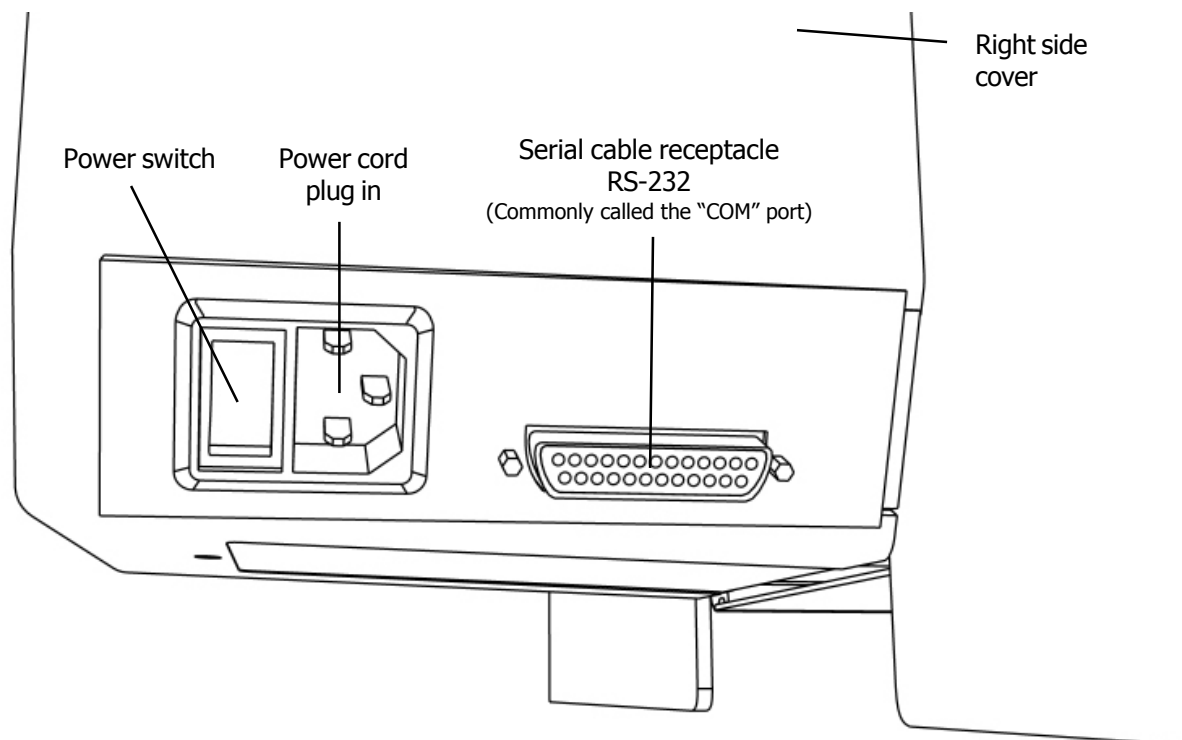


**Fig. 2-12** Rear Panel Assembly



## **Chapter 3 Setup & Operation**

This section contains guidelines for basic operation of the 350HF System Cutter. The following primary topics are explained and illustrated:

- 350HF Keypad Controls
- 301 Software Screen Options
- 301 Software Menu Items
- Control Center Screen Options
- Control Center Menu Items

## Keypad Controls

The keypad on the 350HF provides control of the motion systems on the cutter as well as access to speed, and force control. Blade depth is tested by using the “Test-Cut” button, and repeatability is performed by pressing the repeat button. Communication can also be interrupted and restored and the initial plotting point can be set from the keypad.

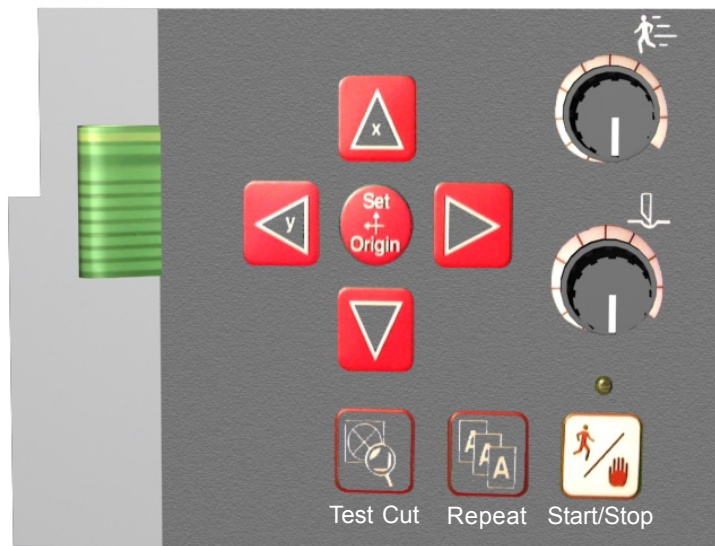


**Fig. 3-1** The 350HF Keypad

### Arrow Keys

The arrow keys control paper (vertical arrows “X”) and blade carriage (horizontal arrows “Y”) limits. The plotter must be in stop mode (red LED) to use the keypad arrow keys. The blade and media speeds become greater the longer the key is depressed. The blade carriage has a safety feature that will not allow it to collide with the end plates. The tray will not allow forward motion outside of the frame during cutting operations. Diagonal motion is possible by pressing a vertical and horizontal arrow key simultaneously.

### Set Origin

You have to set an origin point before sending a cut file to the 350HF. When the Set Origin key is pressed, the plotter logic will use the current X-Axis position of the tray and Y-Axis position of the blade carriage as the starting point of the next plot. The LED will then turn green and the 350HF will accept a plot file.

### Cutting Speed

You can set the speed of cutting by adjusting the knob on the keypad. If the knob is put in the “Minimum” position (6:00), this puts the cutter in “Crawl Mode” which allows the blade to move very slowly for precise positioning. Different materials require different speeds for cutting accuracy, and correct depth. For more information, see *Chapter 4: Cutting quality problems*.

### Blade Force

You can set the Blade force by using the knob on the keypad. The minimum value (10 Grams) and maximum value (175 Grams) of the available force can be set from the 350HF Control Center if you are plotting with a pen. If you are using a blade, the force is 2000 grams. The range is adjustable depending on what the “Minimum” and “Maximum” force is in the Control Center. Material type and thickness determines the correct force setting range on the keypad force knob.

### Start/Stop

The Start/Stop key controls communication between the plotter and the computer. When the communication line is open the LED will be green (Start mode). The LED turns red when communication is stopped (Stop mode). Plot files, and Control Center settings can only be sent to the cutter when communication line is open (green LED).

### Power LED

The light emitting diode (LED) immediately above the Start/Stop switch indicates the state of communication and provides error codes. LED error codes can be found in *Chapter 4* in the *LED Codes* section. The LED is red after power is turned on and the carriage resets. A red LED also indicates that the communication line is interrupted between the cutter and the computer. When communication is open between the cutter and the computer the LED will be green.

## Test Cut

Pressing Test Cut on the keypad will cut a small square with a circle divided into 4 pie pieces (See drawing below). This pattern is designed for adjusting the correct blade depth on the blade holder. For a diagram showing correct blade depth, see the 350HF User's Guide under "Setting up the blade." Pressing the test cut key for approximately 2-3 seconds will cut the Ioline logo. This is designed as a further test to see how the blade is cutting with more complex shapes, and letters.

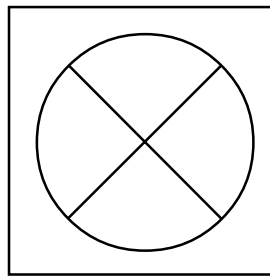


**Fig. 3-2** Test Cut

## Repeat

The repeat button serves two purposes.

- 1) To repeat the same cut over and over again on a new piece of material without having to re-send the file from the computer.
- 2) To repeat the same cut on the same piece of material if the material is hard to cut such as Leather, or Felt.

When a file is sent to the 350HF to be cut, it is stored in the memory buffer of the 350HF system cutter. After loading the tray with a new piece of material, press the "Start/Stop" button so the keypad light is "Red". After setting the blade in the starting position, you can press the repeat button. The same file will then cut out on the new piece of material without having to re-send the cut file from the computer. Note: It is only necessary to press the "Star/Stop" button after sending the file from the computer. Pressing the repeat button will leave the light red when it is finished.

If you are cutting "Hard to cut" material such as Leather, or Felt then the repeat button serves a valuable function. When the file is done cutting, press the "Start/Stop" button so the keypad light is "Red". Press the repeat button, and it will "Re-cut" the same file directly over the previous cut. This technique is good for thick material that doesn't cut right the first time, and may take several "Repeats" to cut through fully.

### Software Installation

**Note:** For detailed instructions on the use of the 301 software see the *301 User Guide (Included on the installation CD supplied with the plotter or available online at [www.ioline.com](http://www.ioline.com))*.

The Ioline 301 Embroidery software is a Microsoft Windows 95/98/ME/NT/2000/XP compatible program that comes on a CD ROM disk with the cutter or is available online at [www.ioline.com](http://www.ioline.com). A Macintosh version of the 301 software is not available. The 301 software will perform the following:

1. Import most popular embroidery files including Tajima, Toyota, PLT, Melco, and Barudan.
2. Export in most popular file formats like Tajima, Toyota, PLT, Melco, and Barudan.
3. Cut out multiple appliques in multiple layers.
4. Create multiple stitch files in multiple layers.
5. Stitch editor program for editing all facets of a stitch.
6. Design Setup window for easy shape duplication, rotation, and layer selection.

### Installing the 301, and Control Center Software

The 301 software can use either a mouse or the keyboard of the computer to change the default plotter settings. If using the keyboard, note the following guidelines:

- Use the Tab key to cycle through the screen fields.

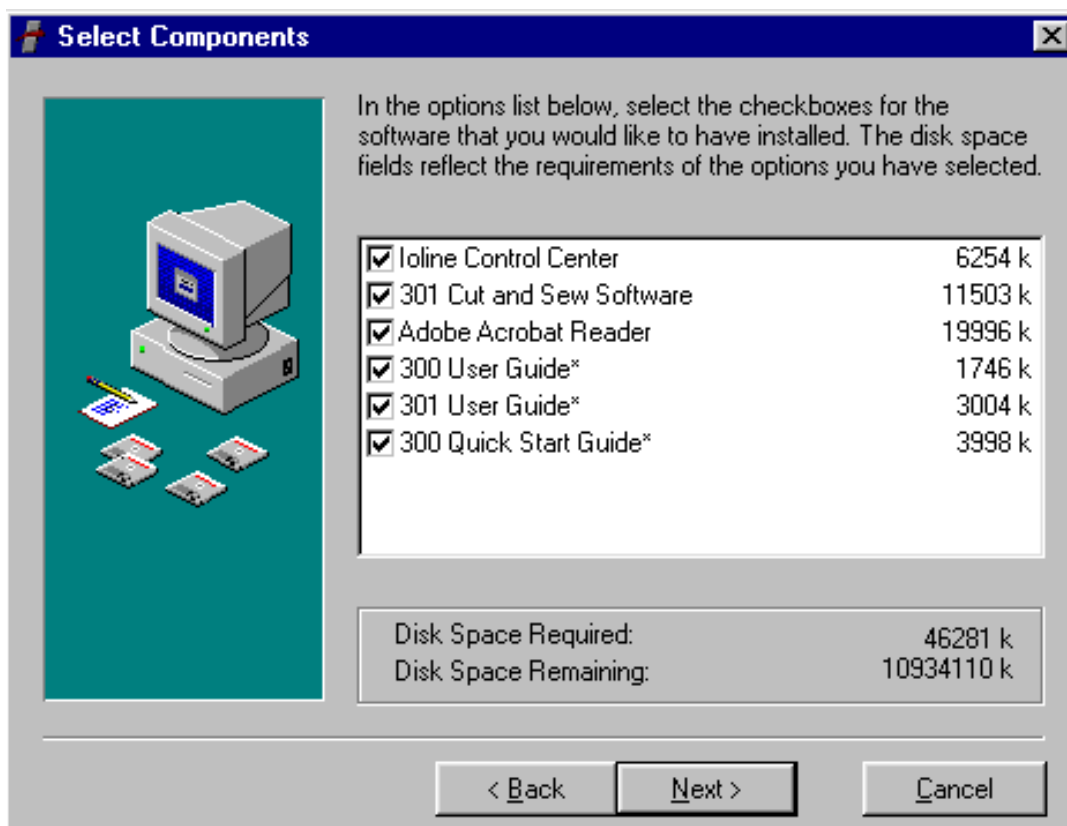


**Fig. 3-3** 301 and Control Center installation screen

- Use the up/down cursor movement or numeric keypad keys to change a numeric value within a highlighted menu field.
- Use the Alt key to toggle between the screen fields and the pull down menus.
- Use the Enter key to select a highlighted field when a pull down menu is open.

### Windows 95/98/ME installation

1. Place the disk in your CD ROM drive.
2. The CD should Autorun once it is placed in the drive, and the drive door is closed.  
The install wizard will now start the installation process. Follow the prompts until the installation of the Ioline 301 and Control Center software is finished (*See Fig. 3-2 on the previous page*).
3. If the CD does not Autorun, click on the “Start” button and then “Run”.
4. In the Run window click on “Browse”, and select your CD ROM drive in the box labeled “Look in”.
5. Select the file “IOSETUP.EXE”, and click “OK”.
6. In the Run box, click “OK”.

The install wizard will now start the installation process. Follow the prompts until the installation of the Ioline Control center is finished.

### Windows NT/2000/XP Installation

Installation of the CD ROM is the same for Windows NT/2000/XP as for Windows 95/98/ME. Occasionally, the hardlock driver requires an upgraded version to operate properly. If the operationg system fails to recognize the key (see next section “Installing the hardlock), visit [www.ealaddin.com/hardlock/downloads.asp](http://www.ealaddin.com/hardlock/downloads.asp) and download the file “HLDREV32.EXE”. This file is a self extracting file, so when the download is complete, “Run...” the file from the Run dialog box. After installation is complete, you can use the 301 software in Windows NT/2000/XP. If you can not obtain this driver over the internet, contact Ioline Tech Support for a disk, or e-mailed file.

### Installing the Hardlock Key

The Hardlock key is a device that allows you to use the 301 software (A common name for this device is a "Dongle"). Without it, the software will not work. The Hardlock key comes with the 350HF system cutter in the accessory kit, and plugs into your computers *printer port*. (See drawing below)

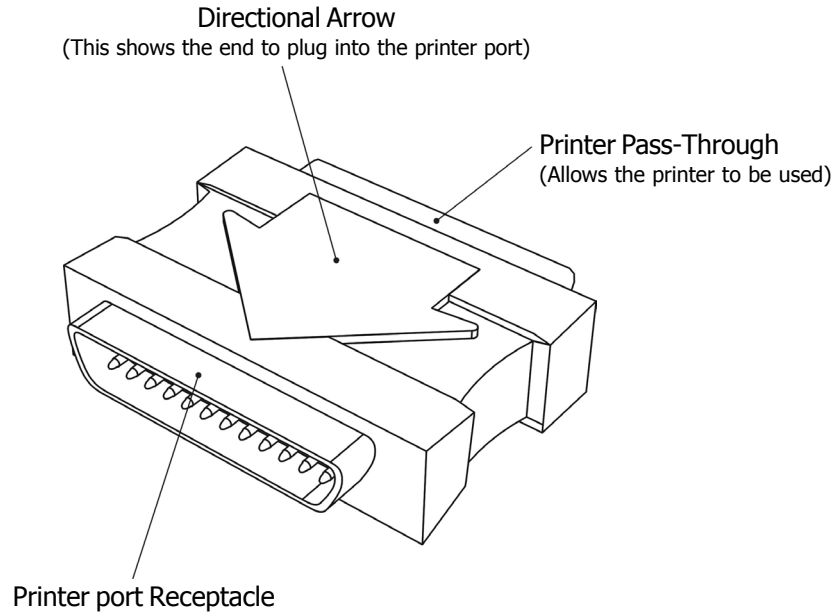


**Fig. 3-4** 301 Software Hardlock Key

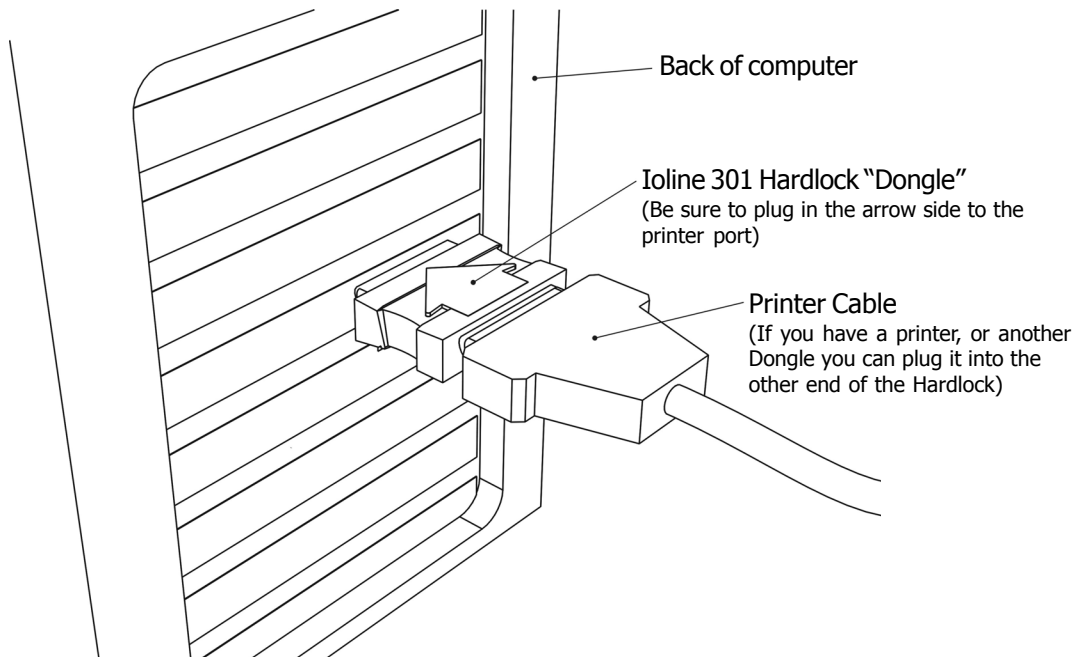


**Fig. 3-5** Rear view of computer showing correct installation of the Hardlock and printer

### Control Center Software

The Control Center Software provides an interface that allows detailed changes to 350HF cutting parameters.

#### Screen Options

The main Control Center screen provides access to the primary plotting parameters. Any changes that are made must be sent as temporary or permanent settings before they take effect. Press the Start/Stop key and make sure the green LED (Start mode) is on before attempting to send any changes to the plotter.

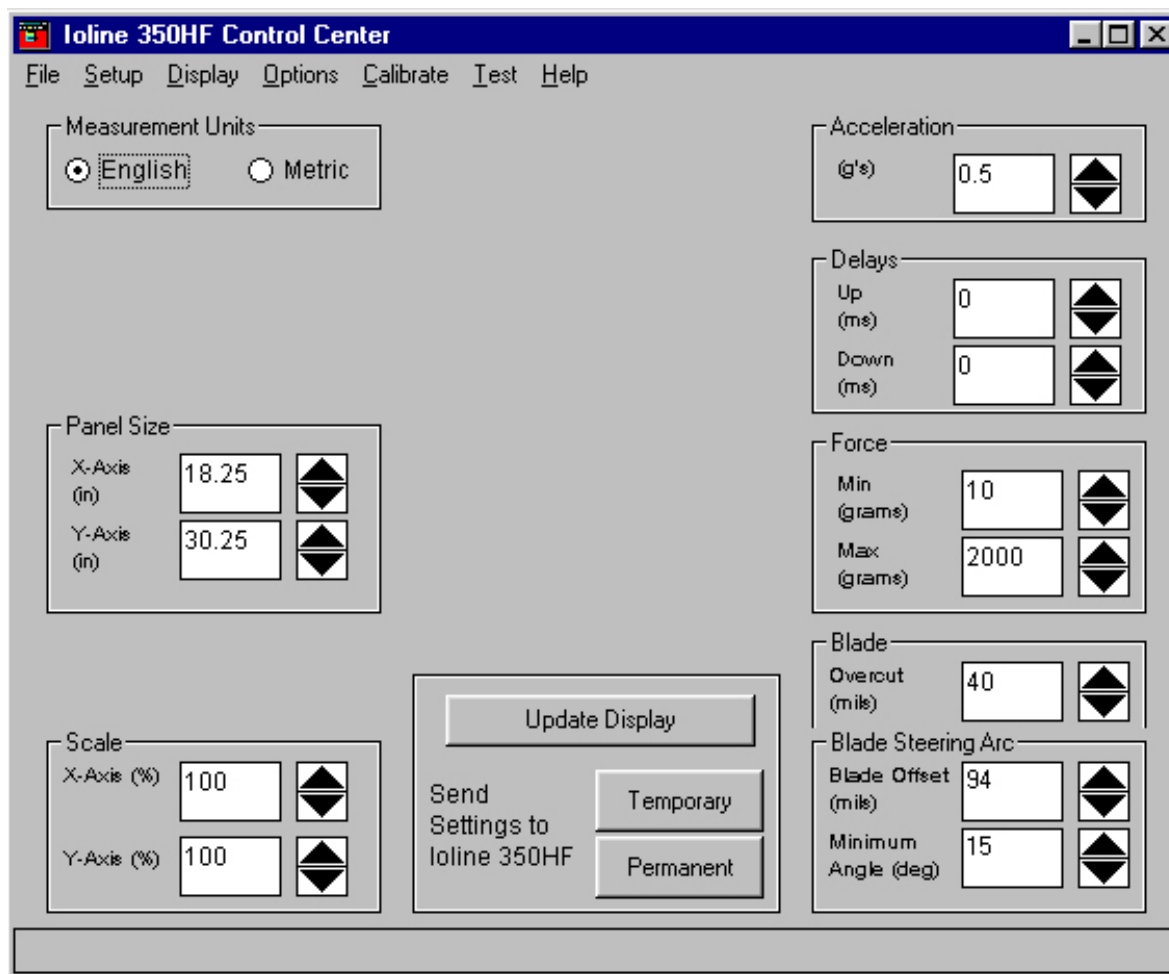


**Fig. 3-14** Ioline Control Center Window

### Measurement Units

English or Metric unit systems may be used for length and speed settings.

### Acceleration

The acceleration setting determines how quickly the blade will change speed when starting or ending a line. The factory default acceleration setting is 1.0 g (1 g = 32.2 ft/s<sup>2</sup>). The setting range is 0.1 to 1.0 g.

### Up/Down Delays

Up/down delay controls how long the blade hesitates when actuated. Zero delay makes the blade rise instantly when line drawing is finished. By default it takes the blade 6 milliseconds to lower onto the paper when the logic powers the voice coil. Longer blade delay settings make the Blade move more slowly but may improve the quality of the cut line. The setting range is 0 to 250 ms (milliseconds).

### HPGL Default

Your 350HF cutter supports three industry standard plotter languages; HPGL 7475, HPGL 7596, and DMPL. Your 350HF will automatically switch between DMPL and HPGL. The plotter cannot distinguish between HPGL 7475 and HPGL 7596 so the version number must be set in the Control Center before a plot file is sent.

HPGL stands for Hewlett Packard Graphics Language and DMPL stand for Digital Microprocessor Plotter Language. HPGL 7475 is the default plotting language and is the most common in the industry. It has a lower left origin which means the 350HF begins plotting from the lower left (keypad side, front of tray) and measures everything from this location. HPGL 7596 uses a center origin and is much less common. A center origin means the 350HF begins cutting from the center of the panel and measures everything from this location.

### Send Settings to the 350HF

When changes are made in the screen dialog boxes the plotter logic has to be updated via the serial link. Three options exist to make the changes take effect. Sending the settings with the Temporary button will replace the current plotter parameters until the power is turned off or new settings are sent from the control center. If the Permanent button is used to send the settings they remain in the plotter (even after the power is turned off) until they are changed from the Control Center. The update Display button displays the "Current" status of the cutter. If you are unsure about the settings currently setup on the plotter, pressing the Update Display button will show you what they are.

### **Force**

The Force setting control in the 350HF Control Center is adjustable from 10 to 2000 grams. The ability to cut different types of fabric and leather requires heavy force, so it usually doesn't need adjustment. However if you wish to adjust the force you can select a minimum and maximum force setting in the Control Center. This will make the range of the force knob on the 350HF cutter to the range you set in these fields.

### **Panel Size**

The default panel size for the 350HF System is 18" long by 30" wide. This size is the cutting area of the 350HF cutter, and can not be set any bigger than the default size.

### **Scale**

By default the 350HF will produce a cut at 100% the size of the specified in the plot file (no scaling). If the X and Y scale is set to 50% the 350HF will produce an applique that is half the specified size. You can set either or both the X and Y scaling of the plot from 1% to 999%.

### **Blade Overcut**

Because of the angle of the blade, the machine must perform an Overcut move to meet up with another line. If you picture dragging a stick in the sand behind you, the angle of the stick is the angle of the blade. Your body represents the center (or pivot) point of the blade, and the tip of the stick represents the tip of the blade. If you draw a box in the sand with your feet, it will look fine. But if you draw the same box with the stick behind you at an angle, the corners will be rounded. This is where the overcut comes in. It drags the tip of the blade past the corner point so it makes the corners square instead of rounded.

### **Blade Steering Arc**

The blade steering arc is simply the rotational angle of the blade around a corner. If the blade is cutting a box, each corner is a 90 degree angle. In order for the angle to be cut right by an angled blade, the machine must perform a rotation around the 90 degree angle for it to look good. Typically the Blade Steering Arc is 30 degrees for a 45 degree blade, and 15 degrees for a 60 or 30 degree blade. These are good standards for cutting out most materials.

### Menu Bar Items

The menu items along the top of the screen allow adjustment of a variety of settings for computer control of the Ioline plotter. File management, plotter setup and serial port testing can all be accessed from the menu bar.

#### File

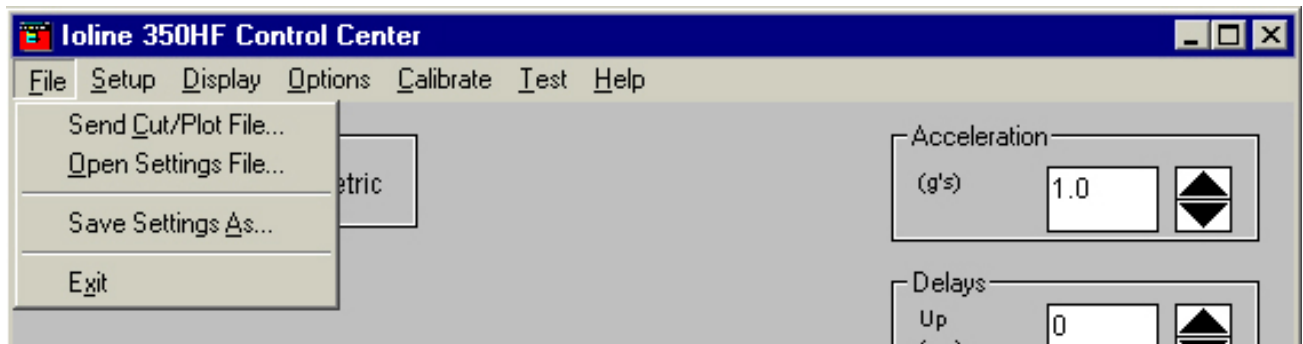


**Fig. 3-15** File Menu

#### Send Cut/Plot File

Use this option to send plot files (.PLT, or .PLX format) to the 350HF.

#### Open Settings File

Opens custom settings for the 350HF that have been stored with the *Save Settings As...* option below. When the 350HF is shut off these settings will be lost. The factory default settings will be in effect the next time the plotter is powered up.

#### Save Settings As...

Allows custom settings to be saved to a file so that they can be sent to the 350HF at a later time. To retrieve these files use *Send Settings File* explained above.

#### Setup

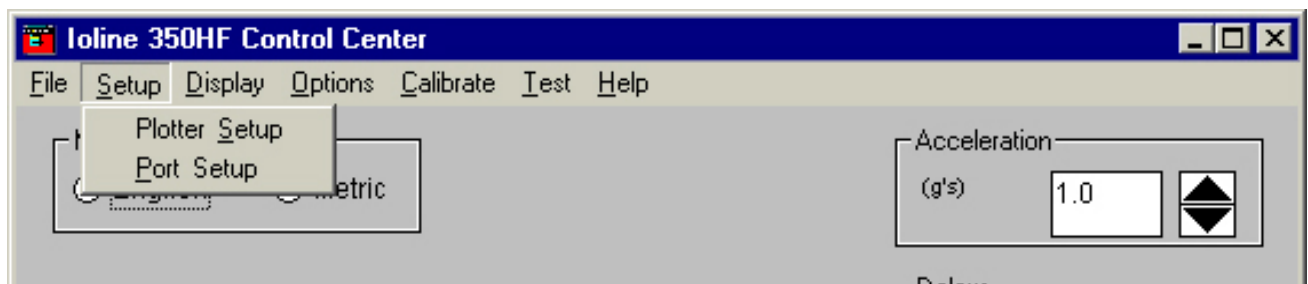


**Figure 3-16** Setup Menu

### Plotter Setup

Allows selection of the plotter model and COM port.

### Com Port Setup

Provides a list of COM ports to select from.

## Display

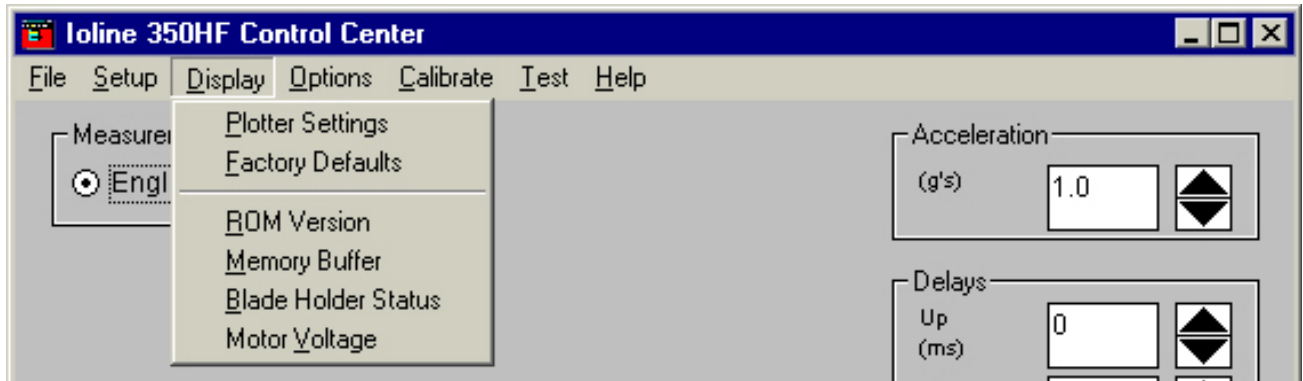


**Figure 3-17** Display Menu.

### Plotter Settings

Replaces all of the screen values with the current settings stored in the cutter.

### Factory Defaults

Replaces all of the screen values with the factory defaults. A dialog box will appear that allows these values to be sent to the plotter.

### ROM Version

Displays the current ROM (or Firmware) version installed in the plotter.

### Memory Buffer

Displays the amount of buffer memory on the logic board. This value should be 890K (Kilobytes)

### Blade Holder Status

Displays whether or not the blade holder is installed.

### Options

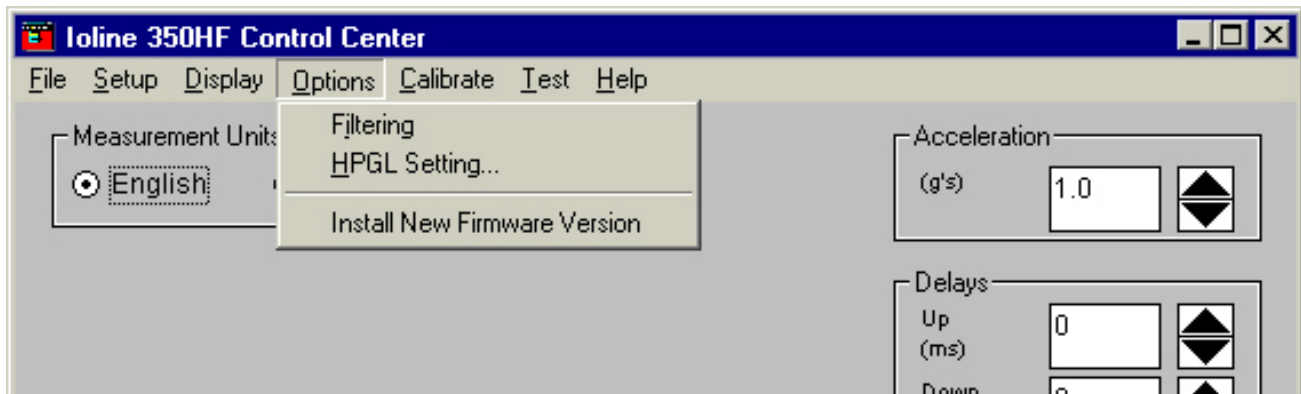


**Figure 3-18** Options Menu

#### Filtering

Displays the filtering dialog window. Some files don't produce quality curves, or line structure. Enabling the filtering option helps to smooth out some of these lines.

#### HPGL Setting...

Allows the 350HF cutter to switch between HPGL/7475 (Lower left origin), and HPGL/7596 (Center origin).

#### Install New Firmware version

- 1) Copy the file that was sent to you by Ioline Tech Support or downloaded off the Ioline web site to the hard drive of the computer that is connected to the 350HF System Cutter.
- 2) Click on "Install New Firmware Version".
- 3) Click on "Begin Version Install".
- 4) The next window shows the file structure on your computer. Find the file that was sent to you (.bin file). Click on the file, and click on "OK".
- 5) The plotter will make a beep sound, and the light will turn off. The new firmware will now start to load into the plotter. When it's done, close the Ioline Control Center, and turn the plotter off.
- 6) Reset the machine by turning it back on while pressing and holding the "UP" arrow key on the keypad of the 350HF System.
- 7) Recalibrate the machine using the values on the right side endplate of the machine. *(See the 350HF User guide for the Calibration procedure).*

### Calibration

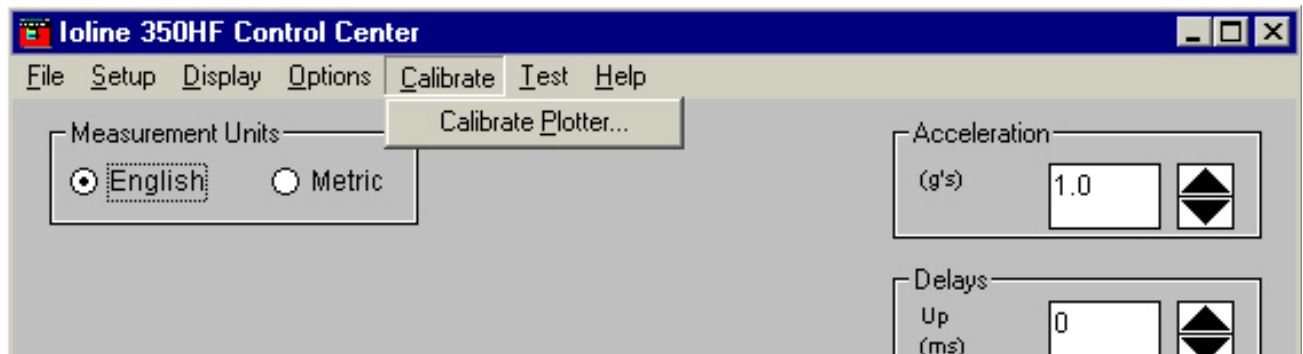


**Figure 3-19** Options Menu

#### Calibrate Plotter

Provides methods to calibrate the cutter for maximum accuracy. The 350HF System is calibrated at the factory, and should not need dimensional calibration. If you feel the cutter is not dimensionally accurate, contact Ioline Tech Support at (425) 398-8282.

### Test

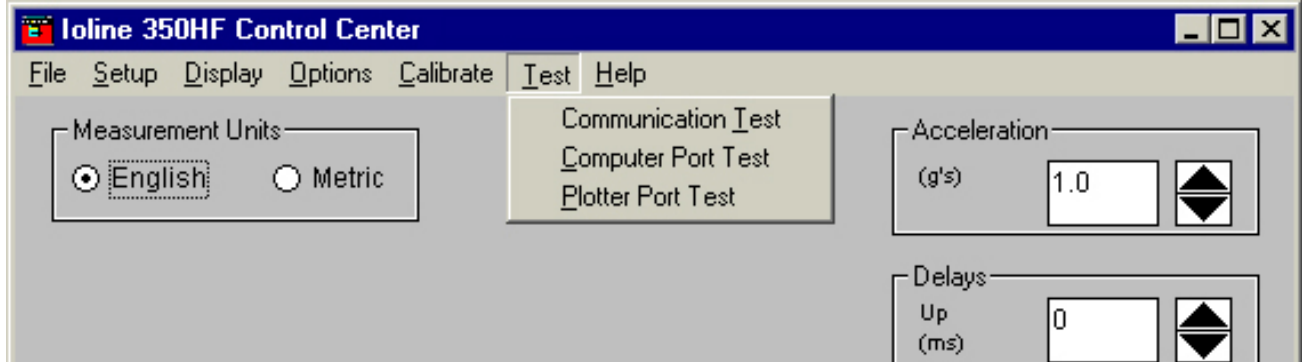


**Figure 3-20** Options Menu

#### Serial Test

Tests the serial connection between the plotter and the computer. See *Chapter 4, Communications Problems* for further information.

#### Computer Port Test.

Tests the serial port on the computer with a special tool available from Ioline. See *Chapter 4, Communications Problems* for further information.

#### Plotter Port Test.

Tests the serial port on the plotter with the “Diagnostic Module” available from Ioline. See *Chapter 4, Communications Problems* for further information.

### Help

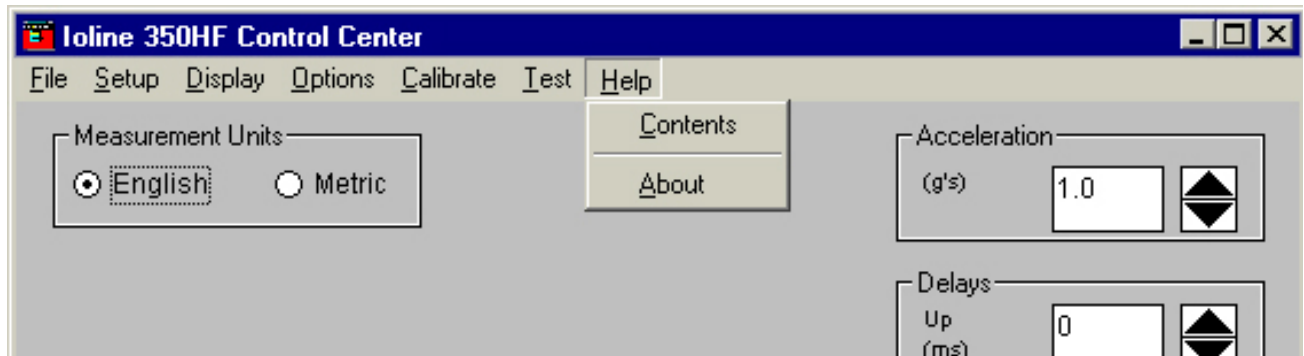


**Figure 3-21** Help Menu

#### Contents

Lists the contents of the help screen.

#### About

Provides revision information about the Ioline Control Center software.



## ***Chapter 4 Troubleshooting and Testing***

This section contains guidelines and testing procedures for resolving most cutting difficulties. Some of this information coincides with repair procedures located in Chapter 5. The following primary topics are explained and illustrated:

- Basic Operational Difficulties
- Mechanical, Electrical, and Electronic Diagnostic Processes
- Contacting Ioline Customer Service

### Basic Operational Difficulties

If the cutter isn't working correctly it is very important to determine which component is causing the problem. Likely difficulties may involve the computer, the power cord, or serial cable, the design software, or the 350HF. If the problem appears to be with the computer or design software consult the appropriate documentation or an Ioline dealer first.

Information in the following sections is organized to eliminate minor problems with easy solutions first. If these remedies do not fix the problem, more complex and invasive resolutions are provided. If a solution cannot be found in this manual or by changing the software and computer setup, fill out the *Diagnostic Record* at the end of this chapter and contact Ioline customer service.

### Common Problems

| Problem                                                        | Cause                                                                        | Solution                                                                                                                                          |
|----------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| The cut file doesn't start in the correct place on the tray.   | The "Origin" has not been set.                                               | Press the "Set Origin" button on the keypad with the knife positioned where the cut file should start.                                            |
| A file has been sent from the software, but the 350 won't cut. | A communication problem has occurred or the 350 is in "Stop" mode (Red LED). | Make sure the serial port on the computer and the 350 are configured properly. Press the "Set Origin" button on the keypad to obtain a Green LED. |

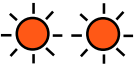
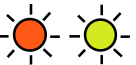
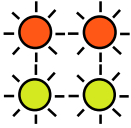
### Error Messages

Error messages that are specific to the 350HF are divided into two categories; software errors and LED codes. Software errors present themselves on the computer screen and usually indicate a communication problem. LED codes are visible below the keypad on the front panel of the 350HF and can be green, red or a combination of both. The LED code table in this section is for finding the cause of obvious external or communication problems. Later in the chapter a more comprehensive LED index is available for complex mechanical and electronic difficulties. Other errors can occur with the operating system or the design software and should be resolved with the software vendor.

#### Software Errors:

| Error Message                                                                               | Problem                                                                                                              | Solution                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Could not open COMx</i>                                                                  | The software could not locate the cutter on the specified COM port.                                                  | Verify the cutter is connected to that port, or check that the operating system recognizes the port.                                                                                                                                                                                                                                                                                                               |
| <i>Green light not on or cutter not connected to COMx</i>                                   | The software opened the port but could not get a response from the cutter.                                           | Be sure the cutter is connected to the selected port, that the cutters green LED is on, and that the cable connecting the computer to the cutter is functioning. Due to the nature of serial and parallel communication, it is possible to get this message if an attempt is made to interact with the cutter while it's cutting. If this is the case, wait for the 350 to finish cutting and send the file again. |
| <i>Setup COM port and check plotter present.</i>                                            | The last operation requires that the plotter be connected to the port but the software could not find it.            | Be sure the cutter is connected to the selected port, that the cutters green LED is on, and that the cable connecting the computer to the cutter is functioning.                                                                                                                                                                                                                                                   |
| <i>The plotter that you selected is not the same as the one connected to your computer.</i> | The Control Center cannot match the cutter that was chosen at the start up with the one found during initialization. | Select the 350HF cutter from the list.                                                                                                                                                                                                                                                                                                                                                                             |

### L.E.D Codes

| LED Sequence                                                                                                                        | Problem                                                                      | Solution                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <div>3+ Second pause then repeat</div>            | 1. Buffer Overflow<br>2. Communication Problems<br>3. Defective RS-232 Chip. | 1. Perform cutter reset as outlined later in this chapter.<br>2. Perform communication test as outlined later in this chapter.<br>3. Replace the RS-232 chip.                                                               |
|  <div>3+ Second pause then repeat</div>            | Outdated Firmware.                                                           | Check the Firmware version, install firmware if needed. Contact Ioline Tech Support                                                                                                                                         |
|  <div>Constantly Repeating</div>                   | Plotter Language syntax error                                                | The file being sent to the cutter is not of the same language that the cutter is looking for. Open the Ioline Control Center, and run a test file. If the error doesn't happen again, check the original file for problems. |
|  <div>3+ Second pause then repeat</div>          | Carriage ("Y" axis) jam.                                                     | Check to make sure the carriage moves side to side freely and remove all objects causing the jam to occur.                                                                                                                  |
|  <div>3+ Second pause then repeat</div>          | Table ("X" Axis) jam                                                         | Check to make sure the tray moves in and out freely, and remove any objects causing the jam to occur.                                                                                                                       |
|  <div>2 Red Flash<br/>2 Green Flash repeat</div> | Logic Board Error                                                            | Call Customer Service                                                                                                                                                                                                       |

| Legend                                                                              |                                                         |
|-------------------------------------------------------------------------------------|---------------------------------------------------------|
|  | Solid GREEN Light Emitting Diode (LED) on the keypad    |
|  | Blinking GREEN Light Emitting Diode (LED) on the keypad |
|  | Blinking RED Light Emitting Diode (LED) on the keypad   |

### No Power When The 350HF System is Turned On

If the 350HF does not initialize or the fan does not spin when the power is turned on there are a few simple steps to follow to determine if a serious problem has occurred.

1. Check the power cord. Make sure that it is firmly plugged into the wall and into the back of the cutter.
2. Check the voltage at the wall outlet and verify that it is within the operating limits as specified in *Chapter 1, Specifications*.

If there are no problems with the power to the 350HF System proceed to the *Mechanical, Electrical, and Electronic Diagnostic Process* later in this chapter.

### The 350HF Won't Respond to the Computer

If there is a problem getting the 350HF to accept commands from the computer, perform these procedures:

- Verify that the communications cable is correctly connected to the plotter and to the proper communications port on the computer.
- Check to see the computers COM port that is being used is configured to match the 350's serial port settings.
- Cycle the power off and on again to reset the communication port on the 350HF system.
- Make certain that the file and the 350HF are set to the same plotter language.
- If the connection is good and the port assignments appear to be correct, proceed to the next section.

## Communication Problems

Many plotting problems are resolved by testing and adjusting the communications between the plotter and the computer. There are three diagnostic tests that can be run from the 350HF Control Center. These tests are designed to help determine if there are communications problems and isolate where the difficulty is occurring.

The last two tests require a diagnostic module (available from an Ioline dealer) connected to the serial port on the computer or the 350HF. If the following tests do not resolve the problem and the computer and software are working properly, proceed to the Mechanical/ Electrical Diagnostic Process later in this chapter.

### Serial Communication Test:

Run this test from the 350HF Control Center. The diagnostic module will NOT be needed to run this test.

1. Connect the serial port on the 350HF and the computer with a serial cable.
2. From the 350HF Control Center screen, select **Test**.
3. Select **Communication Test**.
4. Turn on the 350HF while holding down the **Test cut** key on the keypad until the 350HF beeps and the LEDs flash three times.
5. Press the Start/Stop key on the keypad to verify that the handshake line (CTS), displayed on the computer, toggles ON and OFF. Leave the handshake lines ON. Press the **Repeat** key to switch the 350HF into ECHO mode. The green LED will come on.
6. Press any key on the computer and verify that the character transmitted equals the character received. If the 350HF and the computer pass all these tests there should not be any problems producing appliques from plot files.
7. Select **Exit** after completing the serial test.
8. Turn off the 350HF at the end of the test. Normal communications will be restored when the power is turned back on.
9. If this test is successful the next two tests are not necessary.

### Testing the 350HF Plotter Port:

Run this test from the 350HF Control Center. The diagnostic module WILL be needed to run this test.

1. Connect the diagnostic module directly to the 350HF serial port.
2. Turn on the 350HF while holding down the **Test Cut** key on the keypad until the cutter beeps and the LED flashes three times.
3. Press any arrow key to transmit and receive characters. Verify the 350HF beeps and the green LED flashes.
4. Turn off the 350HF at the end of the test. Normal communications will be restored when the power is turned back on.

### Testing the Computer Port:

Run this test from the 350HF Control Center. The diagnostic module WILL be needed to run this test.

1. Connect the diagnostic module directly to the serial port on the computer.
2. From the 350HF Control Center, select **Test**.
3. Select **Computer Port Test**.
4. Verify that the COM port displayed is the correct one. If it is not, press the ESC key twice and select the correct COM port from the Setup COM Port Setup menu. Repeat steps 1-4. If any key other than ESC is pressed the computer serial test screen will be displayed.
5. Press any key on the computer keyboard and verify that the character transmitted is the same as the character received.

### Cutting Quality Problems

Good cutting quality is dependent upon a number of different factors. The type of material, environmental conditions, and operator habits are only a few of the variables that can affect the quality of a cut. It is important that the 350HF is loaded and maintained according to the guidelines in the *350HF User's Guide* and in Chapters 2 and 5 of this manual. The table below is a summary of the most common difficulties:

| Problem                                                                                              | Cause                                                               | Solution                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>If a cut file has been sent, and the output is erratic.</i>                                       | The file was sent with the wrong plotter language setting.          | Make sure the file was created with the correct plotter language, or the cutter and the Ioline Control Center are setup correctly.                                                                                                                         |
| <i>If the corners of lines on the completed applique are not completely meeting.</i>                 | 1. Knife Offset is not set correctly                                | 1. Knife offset can be changed in the Ioline Control Center. <i>See Chapter 3 setup &amp; operation of Ioline Control Center</i>                                                                                                                           |
|                                                                                                      | 2. Knife overcut is set too low.                                    | 2. Overcut should be set to 20 for standard twill                                                                                                                                                                                                          |
|                                                                                                      | 3. Loose set screw, or loose belt on the cutter.                    | 3. See chapter 5 for procedures on how to fix a loose setscrew, or belt.                                                                                                                                                                                   |
|                                                                                                      | 4. Carriage is popping off the rail while it's cutting              | 4. Loosen the "Top Wheel lock nut" (See page 23) on the front of the carriage. With a small flat-head screw driver push the silver cylinder up, and tighten the nut while holding the cylinder.                                                            |
| <i>If a cut file has been sent, and the output is VERY slow no matter how fast the speed is set.</i> | 1. The cut file has too many "Nodes" in it.                         | If you are using Corel Trace to create applique files, the output will take a long time, and won't cut very well. Instead, hand trace the file to reduce the amount of Nodes in the file. Or use filtering options in Corel Trace to lower the node count. |
|                                                                                                      | 2. The computer is slow and the Screen Saver or Power Saving is on. | 2. Turn off anything using resources on the computer including Screensavers, Power Saving, and Virus Scans.                                                                                                                                                |

**Common Cut Quality Problems**

### Mechanical, and Electronic Diagnostic Process

The diagnostic processes that follow are detailed and invasive. Do not attempt to service the 350HF until it has been determined that simpler solutions (see above) will not resolve the problem. It is recommended that the sequence represented in the following diagram be followed when troubleshooting the 350HF System cutter. Make sure to record the results of any diagnostic examination on the *Diagnostic Record* at the end of the chapter.

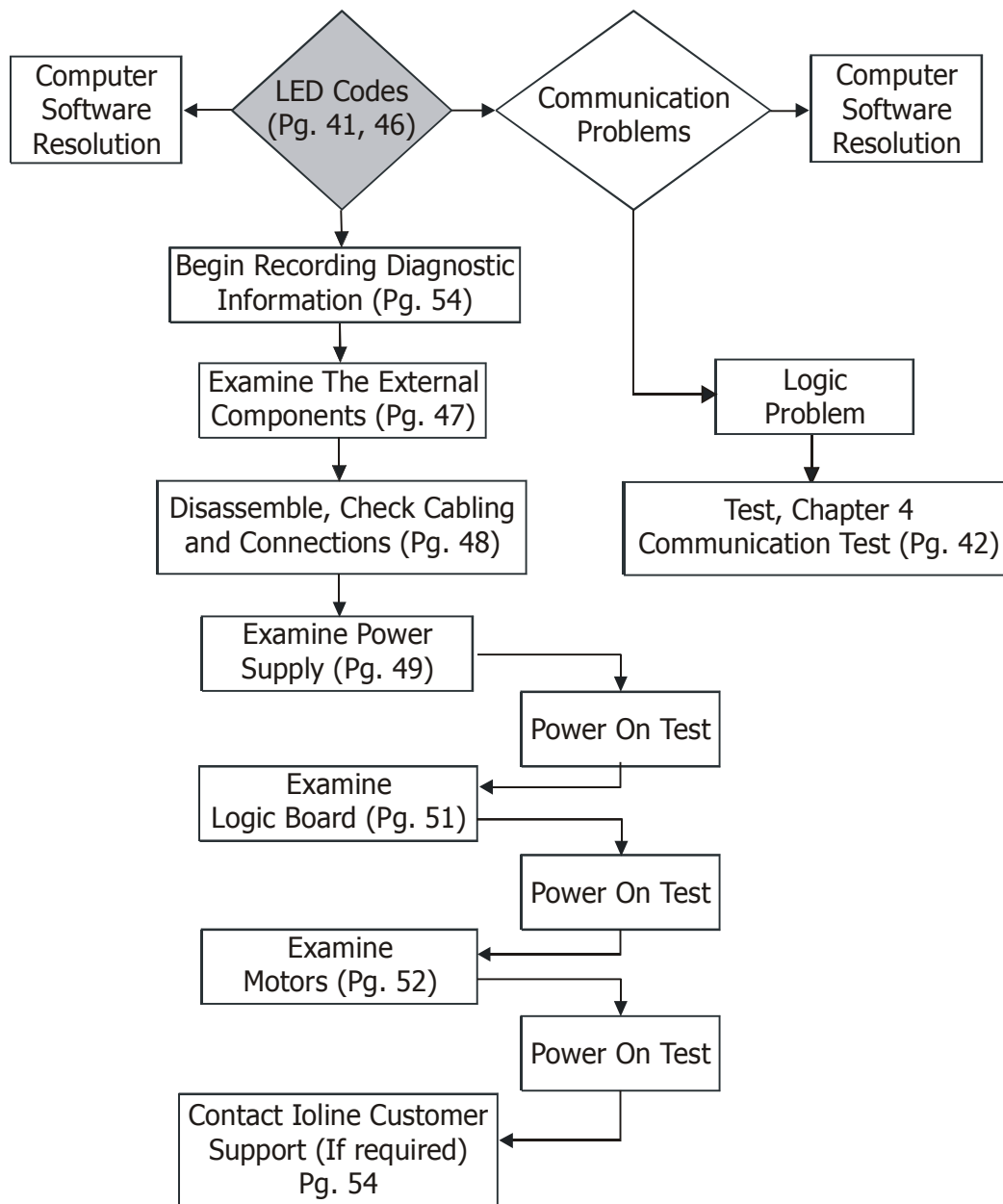
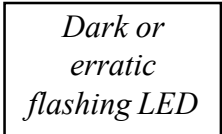
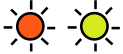


**Figure 4-1.** Mechanical, Electrical, and Electronic Diagnostic Flow Chart.

### Expanded LED Codes

| LED Sequence                                                                                                                        | Probable Cause                                                                                                                                                                                                                                                                                                                                                                                                                                | Solution                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | <ul style="list-style-type: none"> <li>350HF System not plugged in</li> <li>Cycling power supply due to: <ul style="list-style-type: none"> <li>Incorrect power supply or</li> <li>Defective power supply</li> <li>Defective transistor(s) on the logic board</li> </ul> </li> <li>Short or other problem with motor</li> <li>Defective power supply</li> <li>Defective transistor(s) on the logic board</li> <li>Defective keypad</li> </ul> | <ul style="list-style-type: none"> <li>Plug unit into wall outlet</li> <li>Check internally for damaged cabling and loose plugins</li> <li>Replace defective transistor, or replace logic board.</li> <li>Replace the defective motor</li> <li>Replace defective transistor, or replace logic board.</li> <li>Replace defective keypad</li> </ul> |
|  <div>3+ Second pause then repeat</div>            | <ul style="list-style-type: none"> <li>Carriage ("Y" Axis) jam due to: <ul style="list-style-type: none"> <li>Media or mechanical jam</li> <li>Transmission failure</li> <li>Defective power supply</li> <li>Defective transistor(s) on the logic board</li> <li>Defective motor encoder</li> <li>Short or other problem with motor</li> </ul> </li> </ul>                                                                                    | <ul style="list-style-type: none"> <li>Clear any media causing the jam</li> <li>Check internally for damaged cabling or loose wires</li> <li>Replace power supply</li> <li>Replace defective transistor or entire logic board</li> <li>Replace defective motor</li> </ul>                                                                         |
|  <div>3+ Second pause then repeat</div>          | <ul style="list-style-type: none"> <li>Tray ("X" Axis) jam due to: <ul style="list-style-type: none"> <li>Media or mechanical jam</li> <li>Defective transistor(s) on the logic board</li> <li>Defective power supply</li> <li>Defective motor encoder</li> <li>Short or other problem with motor</li> </ul> </li> </ul>                                                                                                                      | <ul style="list-style-type: none"> <li>Clear any media causing the jam</li> <li>Check internally for damaged cabling or loose wires</li> <li>Replace power supply</li> <li>Replace defective transistor or entire logic board</li> <li>Replace defective motor</li> </ul>                                                                         |
|  <div>Less than 2 second pause then repeat</div> | <ul style="list-style-type: none"> <li>Cycling power supply due to: <ul style="list-style-type: none"> <li>Incorrect power supply sequence or defective power supply</li> <li>Defective transistor(s) on the logic board</li> <li>Short or other problem with motor</li> </ul> </li> </ul>                                                                                                                                                    | <ul style="list-style-type: none"> <li>Clear any media causing the jam</li> <li>Check internally for damaged cabling or loose wires</li> <li>Replace power supply</li> <li>Replace defective transistor or entire logic board</li> <li>Replace defective motor</li> </ul>                                                                         |
|  <div>Alternating Red &amp; Green</div>          | <ul style="list-style-type: none"> <li>Syntax Error due to: <ul style="list-style-type: none"> <li>Incompatible Syntax in plot file.</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Replace the defective power supply</li> <li>Remake the plot file, or plot a file from the Ioline Control Center to verify the cutter is working properly.</li> </ul>                                                                                                                                       |

### External Inspection

*Use these procedures if:*

- The 350HF did not initialize (dark LED, fan not running, carriage did not move or made small jerking movements at power on) after it was unpacked from the box and setup following the procedure outlined in the *350HF User's Guide*.
- The 350HF has been working but did not initialize after being reset by turning the power off then on.
- Jam messages occur without media or other objects obstructing normal operation.
- The carriage is making loud or unusual sounds.

#### **Required Tools:**

- Multimeter capable of reading AC voltage.
- Phillips head screw driver.
- Allen wrenches: 1/16" and 5/64".
- Nut driver or socket wrench with extension: 11/32".

#### **Inspecting the Outside of the Unit:**

1. Turn the plotter off.
2. Inspect the unit for damage or obvious signs of mechanical malfunction.
3. Measure the voltage at the wall outlet to verify that it is between 90 and 264 VAC as stated in the beginning.
4. Clear all media paths and ensure that nothing is obstructing the movement of the tray.
5. Move the carriage from side to side by hand. If the carriage resists easy movement then a short is probably present on the logic board or in the motor. Follow the disassembly procedures in *Chapter 5, General Disassembly Procedures* then consult *Testing the Logic Board* and *Testing the Motors* later in this chapter.

*Perform the following disassembly:*

1. Unplug the power cord from the wall outlet and the data cable from the computer.
2. Remove the plastic end covers from the end plates following the procedures outlined in *Chapter 5*.

### Internal Cabling and Connection Inspection

#### WARNING

- *The 350HF cutter is very heavy and could cause an injury if it falls. Make sure that another person assists with moving the cutter .*
- *When the bottom cover of the 350HF is removed and the power is on there is an electric shock hazard. These diagnostic procedures should only be performed by qualified technical personnel or individuals that are aware of safe practices with 110 VAC and 220 VAC devices.*

*Use this procedure if:*

- The procedures in *External Inspection* did not resolve the difficulty.

#### **Tools Required:**

- Phillips head screw driver.
- 5/32" allen wrench (supplied).
- Two people capable of lifting 50 pounds each.
- Grounding strap (optional).

#### **Initial Internal Inspection:**

1. Fully disassemble the 350HF as described in *Chapter 5, General Disassembly Procedures*.
2. Many components in the 350HF are sensitive to static discharge. Make sure that any static electricity is discharged before attempting any service procedures. A grounding wrist strap works the best and can be provided by Ioline on request.
3. Inspect all of the connectors on the power supply, logic board and at the motors to determine if anything came loose during shipping or from rough handling. Gently push on all plugs and socketed logic chips to ensure that they are properly seated.

#### WARNING

**When the plotter is connected to a wall outlet there are high voltages on the power supplies that could cause an injury. Be extremely careful!**

4. Plug the cutter back into the wall and turn it on. Check to see if the plotter resets.

If these procedures are not effective in solving the problem, continue to *Testing the Power Supplies* for the next step in the diagnostic process.

### **Testing the Power Supply**

#### **Tools Required:**

- Multimeter capable of reading DC voltage.
- Ioline power supply test fixture..
- Soldering apparatus (optional).
- Insulating material (electrical tape, mylar strips, etc.)
- One 1/2 watt 1k Resistor, or two 1/4 watt resistors (Optional)

#### **Inspecting the Fuse and Output Terminals:**

1. Turn the power off.
2. Inspect the onboard power supply fuse. If it is defective it can be replaced with a 3/4" x 3/16", 3 AMP, GFE, fast blow fuse or equivalent.
3. Examine the metal terminals at the +24 V output wires. The insulation for these wires is colored green for +24 V, and black or brown for ground. They should be flush against the board and unable to touch each other.
4. If it looks like they could short or if arcing has occurred, re-solder as necessary and/or insulate the wires so that they can no longer contact each other.
5. The power supply may also be returned to Ioline for a replacement.  
If this does not isolate a power supply problem continue to the next step.

#### **Testing the Power Supply Output Voltage:**

1. Turn the power off.
2. Mark the power supply connectors with their associated socket number (J3 or J7).
3. Unplug both power supplies from the logic board. It is very important that they be disconnected from the logic board for correct voltage readings.
4. Connect one of the power supplies to the Ioline Power Supply Test Fixture \*. The plug will only fit on one way.

\* If the Ioline test fixture is not available insert a 1k $\Omega$ , 1/2W resistor into the plug between one of the green (+24V) wires and one of the black ground wires. The voltages are labeled on the logic board at the J3 and J7 connectors.

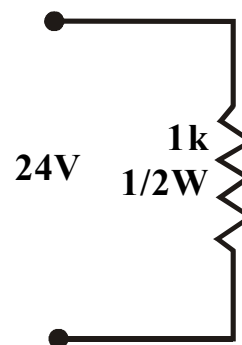
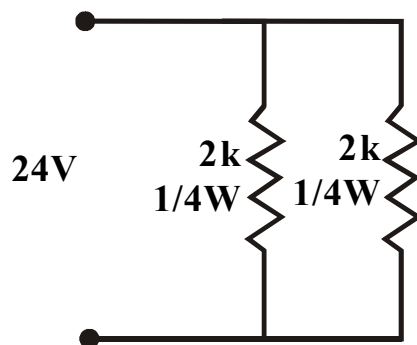
5. The fixture provides labeled test points for all output voltages. Turn the power on and measure the voltages.
6. If any voltage fluctuates wildly or is not within 10% of the specified value then replace the power supply. If the voltages are within the tolerances continue to the next step.

If these procedures are not effective in solving the problem read *Testing the Logic Board* for the next step in the diagnostic process.

### **Reference Information for the Power Supply Test Fixture:**

The information below describes the resistive loads imposed on the power supply when the Ioline Power Supply Test Fixture is used. While not as effective, a 1k $\Omega$ , 1/2W resistor between +24V (green) and ground (black or brown) will also work for testing.

- $R_{24vload} = 1\text{ K } \Omega$ , 1/2 watt (use 2 X 2K $\Omega$  1/4 watt resistors in parallel for  $I_{24vload} \cong 24\text{ ma}$ )
- All load resistors should be within a  $\pm 20\%$  tolerance



### Testing the Logic Board

*Use this procedure if:*

- The procedures in *Testing the Power Supplies* did not resolve the difficulty.
- The carriage was difficult to move during external inspection.

#### Tools Required:

- Phillips head screw driver.
- Multimeter capable of reading resistance in Ohms ( $\Omega$ ).
- Soldering apparatus and grounding strap (both optional).

#### Testing the FETs (Transistors):

1. Turn the power off. Discharge any static electricity as described above.
2. Find the motor power transistors (FETs) on the logic board. They are located near the power input plugs J3 and J7 and are labeled Q1-Q8 and Q10-Q11.
3. If any of FETs have melted, smell acrid or burnt, or have discolored the logic board they should be replaced.
4. Using a multimeter test the resistance between the source (S) and drain (D) leads and between the gate (G) and drain (D) leads on each of the transistors.
5. If any of the resistance measurements are less than 500 k $\Omega$  the part is suspect. If any readings are below 1  $\Omega$  there is an internal short and a definite FET failure.
6. If the FETs are defective and the logic board is revision 0 the entire board should be replaced with the newest version. If the logic board is revision 1 the defective FETs can be replaced with exact duplicates. The transistors at locations Q1, Q3, Q5, Q7, and Q10 are p-channel FETs and can be replaced with Ioline part number 104539. The transistors Q2, Q4, Q6, Q8, and Q11 are n-channel FETs and require Ioline part number 102807 for replacement.
7. If replacing a FET is not possible remove and replace the entire logic board. (*See Pg. 78 Logic board replacement.*)
8. Before the plotter is re-tested with a new logic board and/or new transistors make sure that any media or mechanical jams have been cleared so that the FETs are not damaged in the same manner that might have caused their original failure.

### Testing and Replacing the Other Logic Components

1. If all of the other diagnostic procedures have been exhausted and the FETs are testing good, change the logic board. Communications problems may indicate that the RS-232 chip may need to be replaced. This socketed component is located at U25. No other logic board components can be field tested.

If these procedures are not effective in solving the problem read *Testing the Motors* for the next step in the diagnostic process.

### Testing the Motors

*Use this procedure if:*

- The procedures in *Testing the Logic Board* did not resolve the difficulty.

#### Tools Required:

- 1 Paper clip

#### Motor Inspection:

1. Unplug the Black and yellow wires (for the “Y” axis Motor) or the Black and Red wires (for the “X” axis motor).
2. Un-bend the paper clip so it’s straight.
3. Put the paper clip through the holes in the connections on the motor that you unplugged in step 1. The paper clip should bridge the two connectors together.
4. Move that associated motor (Carriage or Tray) and feel for resistance. Remove the paper clip and feel for the same resistance. If there is a difference in the amount of resistance when the paper clip is on and off, the motor is good. If there is no difference, the motor is bad and should be replaced.

#### Likely Modes of Motor Failure:

1. *An internal short has occurred.* This malfunction exhibits itself as a jam and causes the motor to be more difficult to turn by hand. To determine if a carriage motor has shorted, unplug the input power leads and move the carriage by hand. If the motion has a high resistance the motor is probably shorted.
2. *The motor encoder has failed.* The encoder allows the plotter logic to keep track of axis positions and speeds. When an encoder fails the motor may work at low speeds but during acceleration it speeds up abnormally then jams.

### Tray (X Axis) Motor Replacement:

If the tray quickly accelerates and jams and the FETs are not defective, or if unexplainable X axis jams occur the motor may be defective. See *Chapter 5, X-Axis Motor Replacement* section for the replacement procedure.

### Carriage (Y Axis) Transmission

1. Turn the power off.
2. Make sure that the carriage (Y axis) transmission belts are not damaged, mistracking or loose. Closely check the belt teeth for excessive wear.
3. Loosen the transmission retaining nuts (there are four) with the 11/32" nut driver and retighten them.
4. Tighten the allen set screws on the pulleys with the 1/16" and 5/64" allen wrenches.
5. Ensure that the three allen screws (5/64" allen wrench) holding the motor to the transmission bracket are not loose.
6. Actuate the transmission by depressing the left and right keypad arrows with the power on. Test both directions for at least 5 seconds.
7. If unusual noises or mechanical malfunctions are present remove the transmission and return it to Ioline for a replacement.

If these procedures are not effective read *Internal Cabling and Connection Inspection* for the next step in the diagnostic process.

### Carriage (Y Axis) Motor Replacement:

If the carriage quickly accelerates and jams and the FETs are not defective or if unexplainable jams occur the motor may be defective. See *Chapter 5, Y-Axis Motor Replacement* section for the replacement procedure.

### Testing the New Motor:

1. After installation, test the new motor(s) with the keypad arrow keys for five to ten seconds.
2. It is important that care be taken when changing the motor and that proper belt tensions and alignment be attained after the new unit is installed. Never separate the motor and encoder assembly.
3. If replacing and adjusting the motor cannot be accurately accomplished contact a qualified service dealer or Ioline customer service for assistance.

If the difficulty persists and the *Diagnostic Record* (see next page) is completed, contact an Ioline dealer Ioline Customer Service for further help.

### Contacting Ioline Customer Service

If the suggestions and guidelines in this manual cannot help resolve the difficulty contact Ioline Customer Service. When speaking with a customer service representative they will ask a number of questions regarding the results of the diagnostic investigation. Use the following form to record the observations so Ioline can expedite solving the difficulties.

#### Diagnostic Record

- What is the serial number for this unit? \_\_\_\_\_ Logic board revision # ? \_\_\_\_\_
- Who was the dealer that sold it to you? \_\_\_\_\_
- Has the unit been working properly up to the point of the recent failure?  
YES \_\_\_\_\_ NO \_\_\_\_\_
- Are there any blinking LEDs or beeping sounds associated with this problem?  
YES \_\_\_\_\_ NO \_\_\_\_\_  
If yes, please describe them. \_\_\_\_\_
- Were there communication or computer software problems?  
If yes, please describe them. \_\_\_\_\_
- When the plotter is first turned on, does the pen carriage move fully to the right?  
YES \_\_\_\_\_ NO \_\_\_\_\_
- Does the fan come on? YES \_\_\_\_\_ NO \_\_\_\_\_
- With the power off, slide the carriage from side-to-side.
  - Does the carriage slide easily to each side? YES \_\_\_\_\_ NO \_\_\_\_\_
  - Is there more resistance to move the carriage to the left \_\_\_\_\_, the right \_\_\_\_\_, or is it equal? \_\_\_\_\_
- Were all of the cable connections securely fastened to the logic board.  
YES \_\_\_\_\_ NO \_\_\_\_\_
- Were all logic components seated in the logic board. YES \_\_\_\_\_ NO \_\_\_\_\_
- Was the power supply shorting at the terminals? YES \_\_\_\_\_ NO \_\_\_\_\_
- Was the power supply voltages within the tolerances? YES \_\_\_\_\_ NO \_\_\_\_\_
- Record the power supply voltage readings here:

J3, VMOT(+24V) \_\_\_\_\_

J7, VMOT(+24V) \_\_\_\_\_

- Were any of the transistors on the logic board defective? YES \_\_\_\_\_ NO \_\_\_\_\_  
If yes, which ones?  
Q1 \_\_\_\_\_ Q2 \_\_\_\_\_ Q3 \_\_\_\_\_ Q4 \_\_\_\_\_ Q5 \_\_\_\_\_ Q6 \_\_\_\_\_ Q7 \_\_\_\_\_ Q8 \_\_\_\_\_
- Were any of the motors or encoders bad?  
If yes, which ones? X motor/encoder \_\_\_\_\_ Y motor/encoder \_\_\_\_\_
- Please list any other difficulties. Be very specific about the nature of the problem and any symptoms associated with it.

## **Re-Packing the 350HF**

If the 350HF must be returned to Ioline for repair it must be shipped in the original packaging supplied with the plotter. To repackage the 350HF use the plotter Boxing Procedure Diagram in Chapter 6. Contact Ioline Customer Service for shipping instructions.



## **Chapter 5 Repair and Maintenance**

## **Repair and Maintenance**

This section contains instructions for replacing failed assemblies and maintaining the 350HF system cutter. The testing procedures for determining if an assembly is causing difficulties are located in Chapter 4. The following subsystems and procedures are explained and illustrated:

- Cleaning and Regular Maintenance
- General Disassembly Procedures
- Y-Axis Subsystem
- X-Axis Subsystem
- Electrical Subsystem
- Electronic Subsystem

### **List Of Recommended Tools And Equipment**

All of the tools and equipment that are needed to perform the repair and adjustment procedures are listed below:

1. Number 2 Phillips magnetic head screwdriver
2. Precision Pull Scale 1 kg x 20 g (36 oz x 1/2 oz)
3. 9/64", 5/64", 5/32" (supplied), 1/16", and 1/8" Hex Wrenches
4. Socket Wrench Driver
5. 9" Socket Wrench Extension
6. 3/8" Socket or Nut Driver
7. 11/32" Socket
8. 11/32", 1/2", and 9/16" Open End Wrenches
9. Exacto Blade
10. Double back foam tape (3M)
11. Needle nose pliers
12. Volt/Ohm Meter
13. Static Grounding Strap (supplied on request)
14. Ioline Power Supply Test Fixture (available from Ioline)
15. Ioline Serial Port Test Fixture (available from Ioline)
16. Plastic Cable Ties

## **Cleaning And Regular Maintenance**

### **Cleaning the Traverse Extrusion and Carriage Wheels**

As dust and debris accumulate on the traverse extrusion it will have to be wiped off with an isopropyl (pharmacy) alcohol dampened, lint-free cloth.

1. With a clean cloth dampened with Isopropyl alcohol wipe the traverse extrusion where the carriage wheels ride on the rail. Move the carriage side to side while wiping the traverse so as to clean the entire surface. See chapter 2 Nomenclature for the location of the traverse.

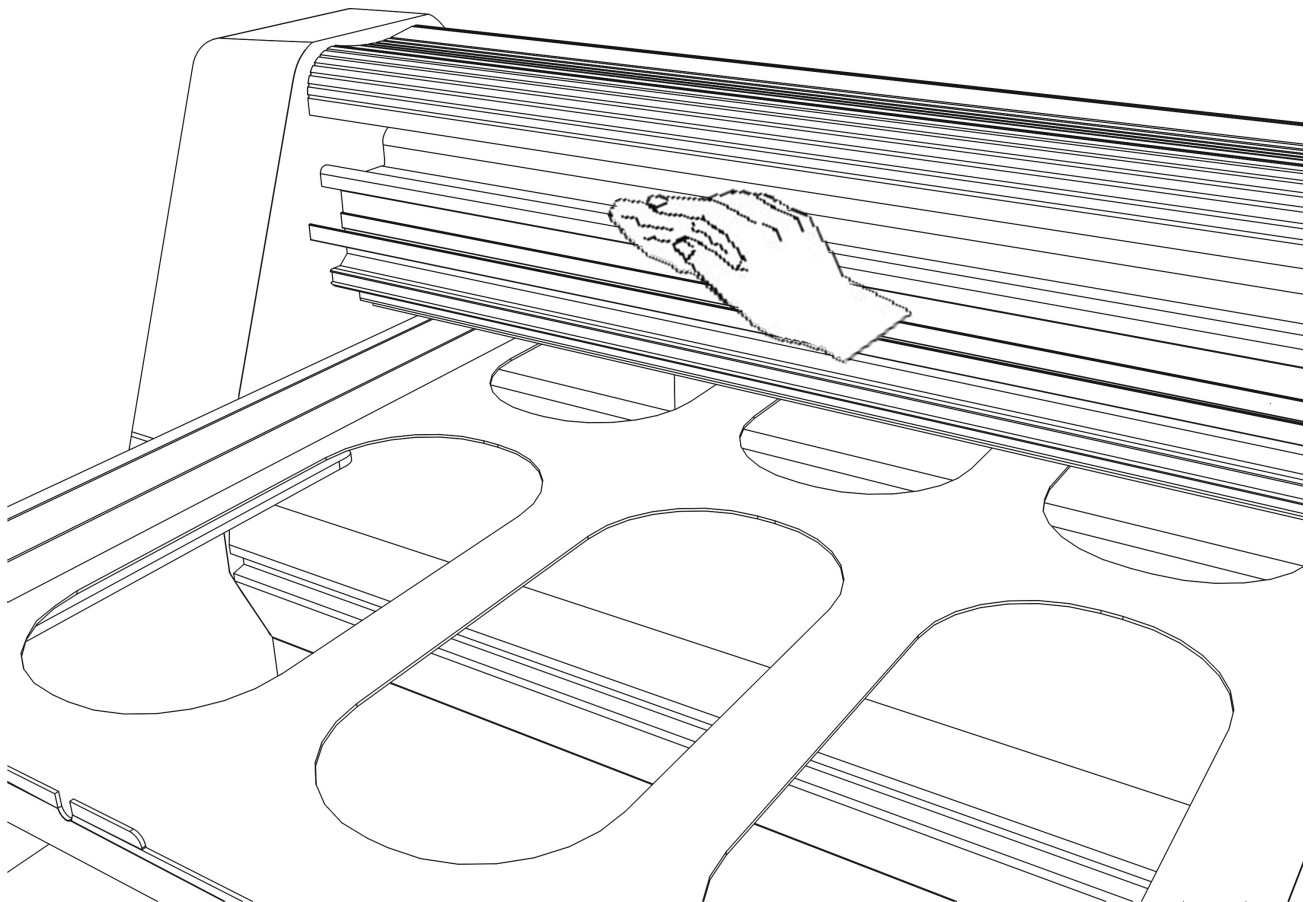


**Figure 5-1.** Cleaning the Traverse Extrusion

## General Disassembly Procedures

The following procedures describe the basic disassembly of the 350HF system cutter to gain access to the keypad, power, and drive components. Please pay close attention to the **Warning** and **Caution** notes.

### Removing the End Covers

1. Turn off the 350HF and unplug the computer data, and power cables.
2. Remove the two phillips head screws, and the single phillips head screw on the bottom of the cover, then remove the right cover. To access the rear screw, you will have to move the tray forward. *See figure 5-2 below.*
3. Remove the two phillips head screws and remove the left cover. *See figure 5-3 on the next page.*

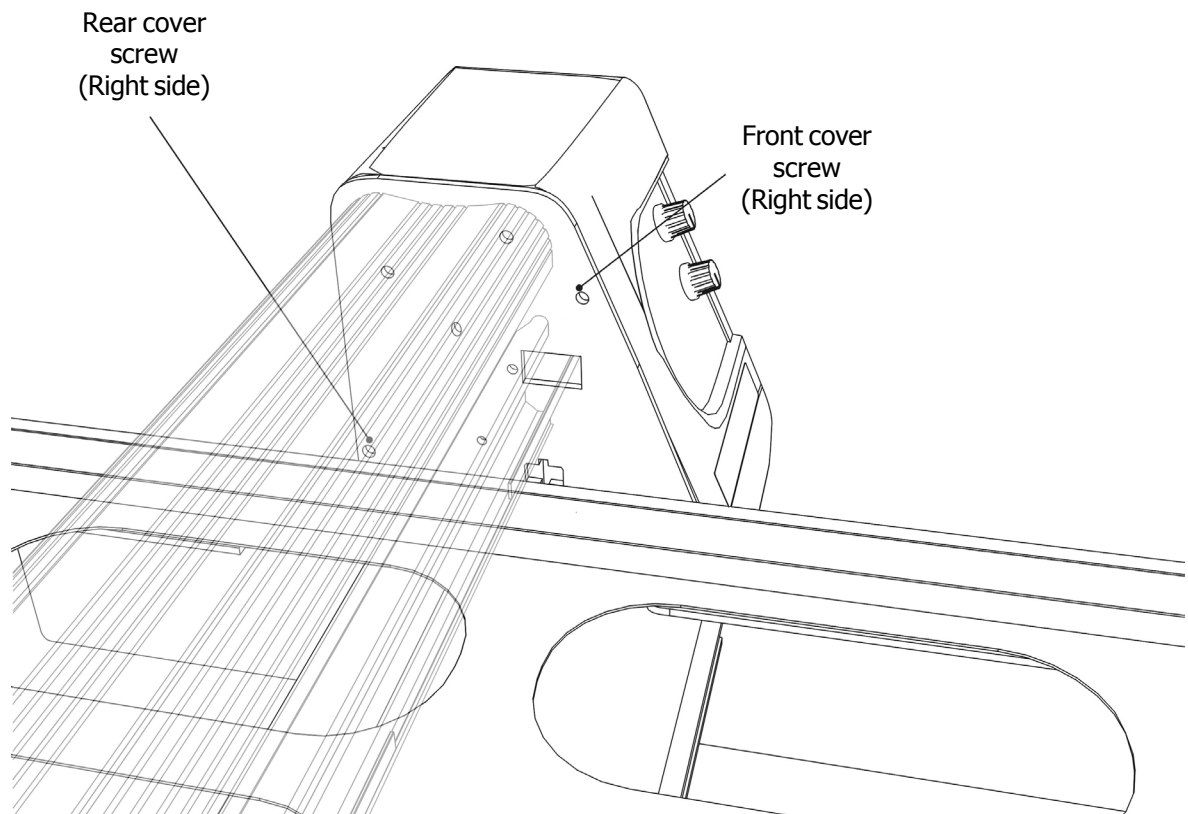


**Fig. 5-2** Right side cover screws (Black Phillips head)

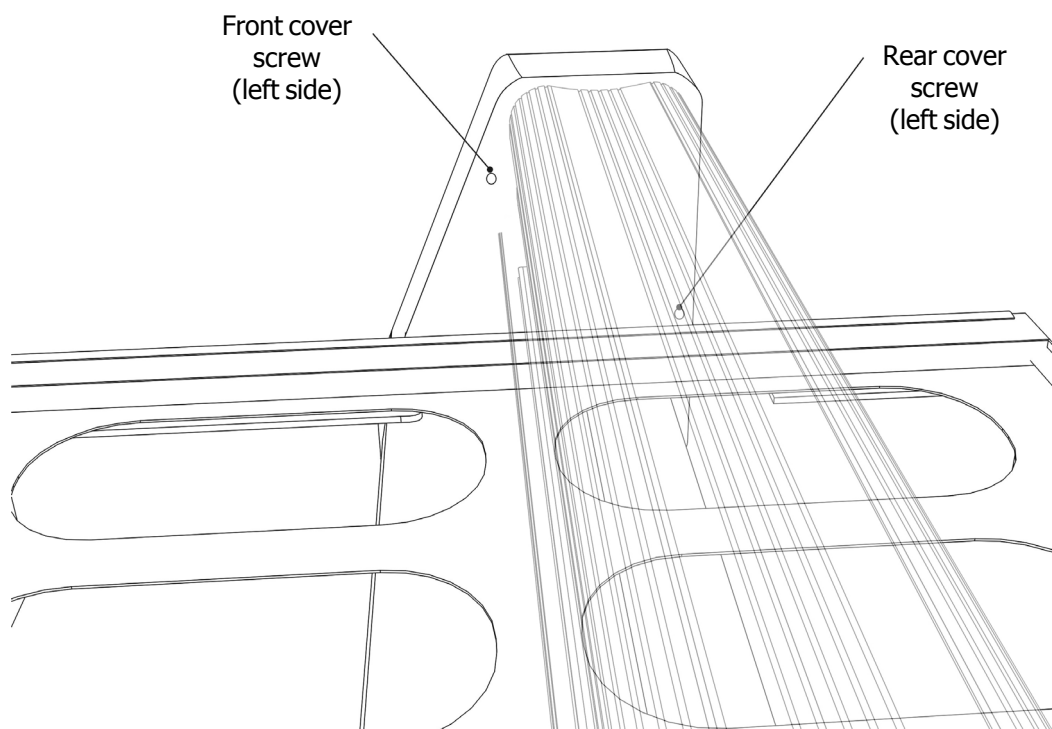


**Fig. 5-3** Left side cover screws (Phillips head)

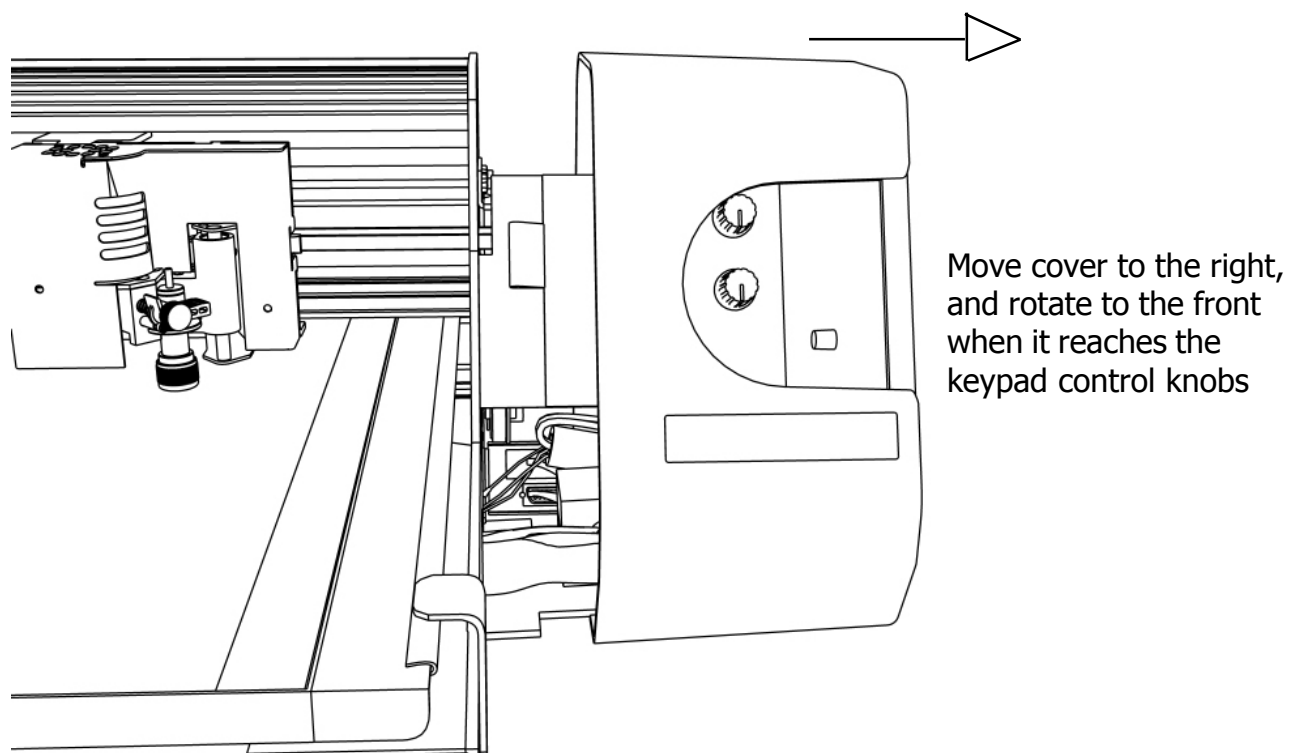


**Fig. 5-4** Removing the right side cover

### Removing the Bottom Cover for Internal Access

#### WARNING

- *The 350HF system cutter is very heavy and could cause an injury if it falls. Make sure that another person assists with moving the cutter.*
- *When the bottom cover of the 350HF is removed and the power is on there is an electric shock hazard. These diagnostic procedures should only be performed by qualified technical personnel or individuals that are aware of safe practices with 110 VAC and 220 VAC devices.*



*Do not lift the 350HF by its top dust cover, or the tray assembly. Use the bottom surfaces of the end plates for lifting and moving the plotter.*

#### Tools Required:

- Phillips head screw driver.
- Two people capable of lifting 50 pounds each.
- Grounding strap (optional).

#### *Perform the Following Disassembly:*

1. Turn the power off, and disconnect the computer data, and power cables.
2. Move the carriage assembly to the right side of the cutter.
3. Remove the right side cover. *See Removing the covers earlier in this chapter.*
4. Use your assistant to help you flip the 350HF cutter over onto its top dust cover. Use the right side cover to place under the tray so it doesn't fall over while it's on its top. See figure 5-5
5. Remove the phillips screws along the bottom cover's edge. See figure 5-6
6. While removing the bottom cover, take care in unplugging the fan wire from the logic board

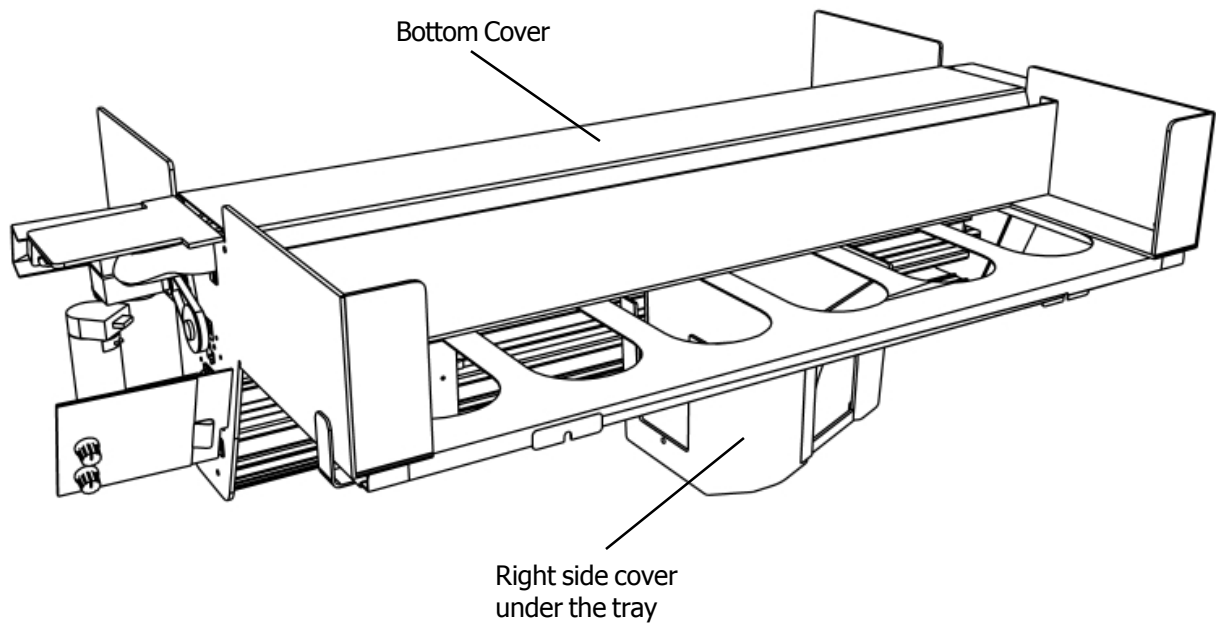


**Fig. 5-5** Turn 350HF over, and place right side cover under tray

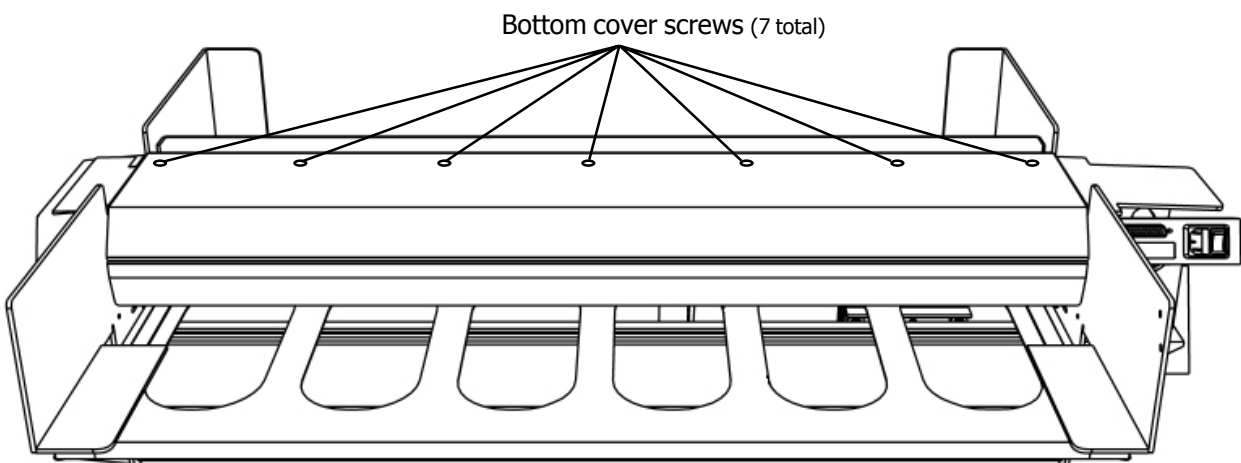
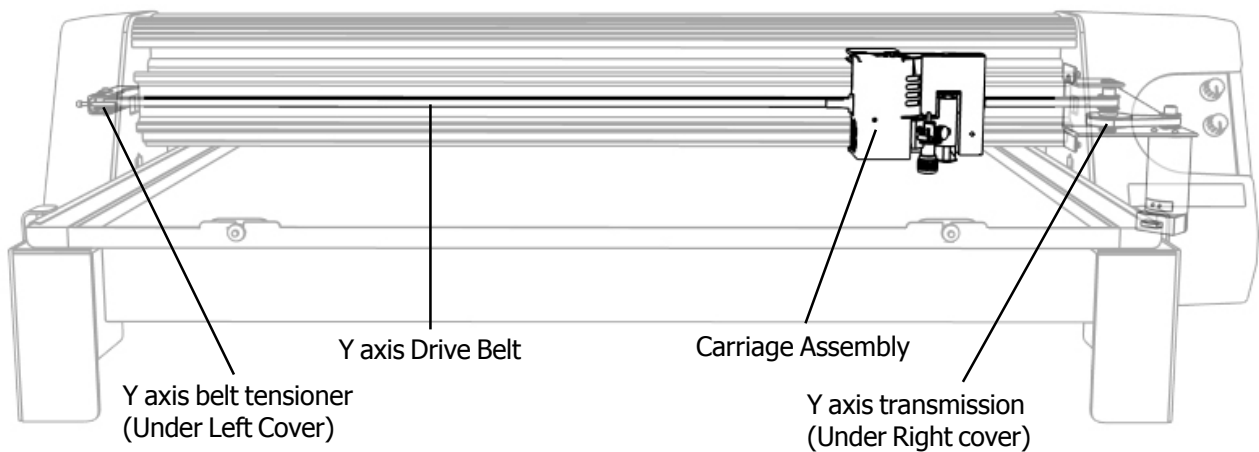


**Fig. 5-6** Bottom cover screws

## Y Axis Subsystem



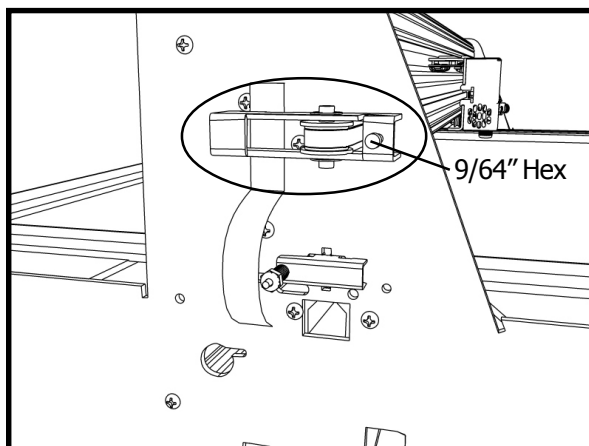
### CARRIAGE REPLACEMENT

#### Step 1. - Removing the Covers

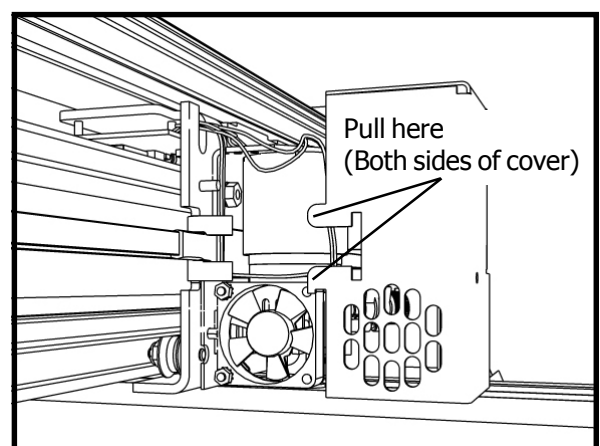
1. Shut off the cutter and remove the power and computer data cables.
2. Remove the right (3 screws) and left (2 screws) end covers. See *Removing the End Covers* earlier in this chapter.

#### Step 2. - Removing the Carriage

1. Remove the blade holder from the carriage. Mark the screw on the Y axis belt tensioner with "White-Out" to mark the position of the screw before you loosen it. Loosen the allen screw on the belt tensioner until the the bracket is flat against the end plate. Do not remove the screw.
2. Remove the cover of the carriage by pulling out on both sides of the cover.

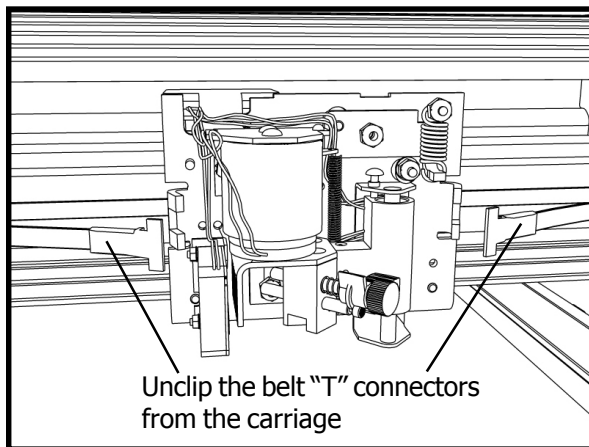


Y Axis Belt Tensioner



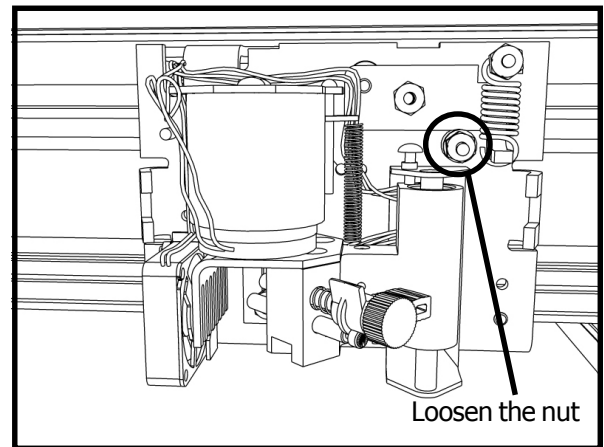
Removing the cover

3. Grasp one of the metal “T”-connectors on the end of the Y Axis belt and pull it toward the center of the carriage until it pops free. Make sure that the tensioner assembly is not tangled in the belt. Remove the other end of the belt from the carriage.



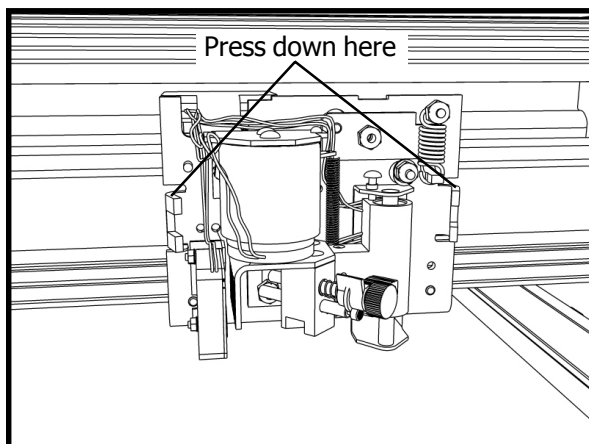
Removing the “Y” axis belt clips

4. Loosen the Top wheel locking nut on the carriage. This dis-engages the top spring wheel so the carriage can be removed from the machine.

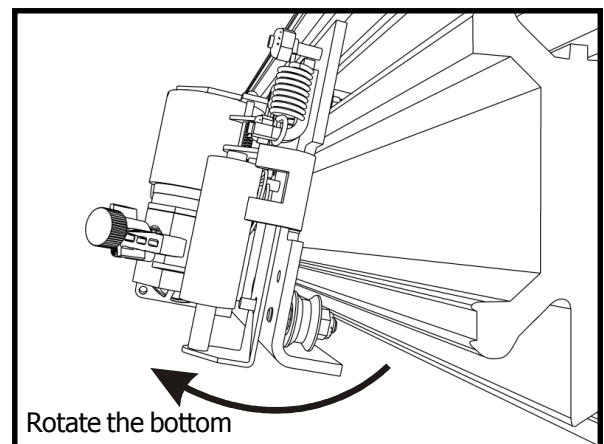


Top wheel “Lock”

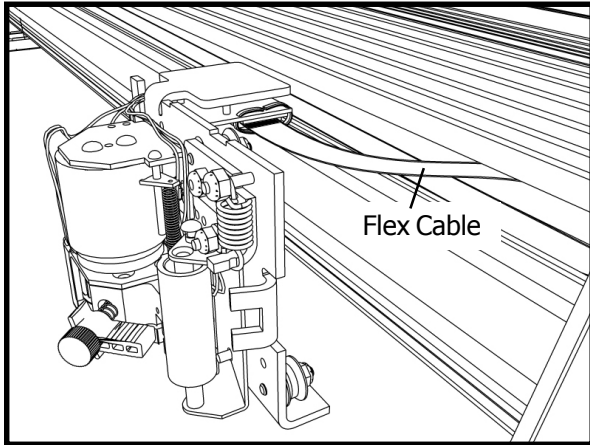
5. Remove the carriage from the machine by pushing down on the belt attachment fingers.



Carriage assembly removal

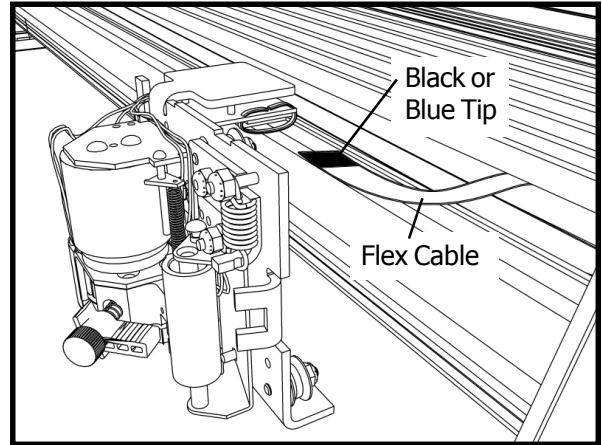


7. Pull the carriage slowly toward the front of the machine being sure not to damage the flex cable.



Flex Cable (Plugged in)

8. Carefully pull the flex cable from the socket on the carriage.

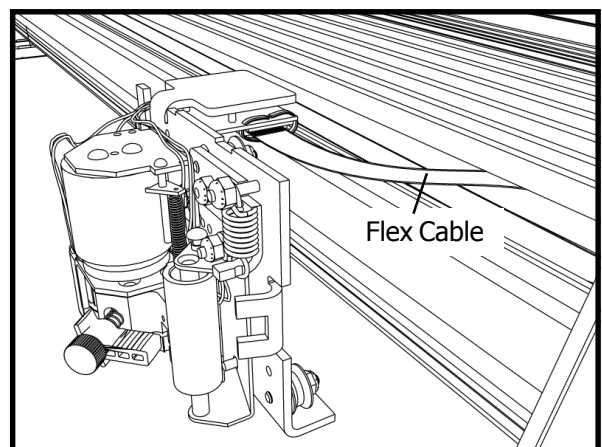
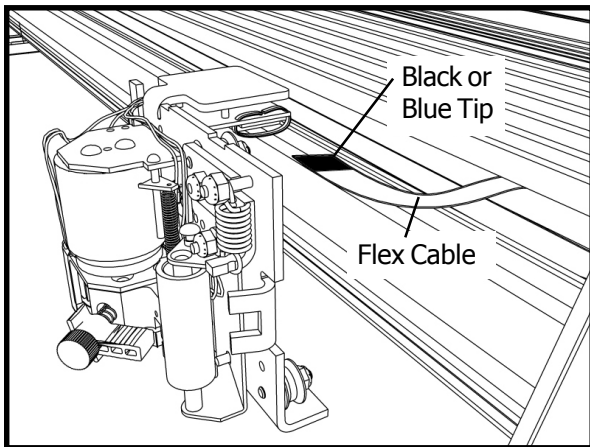


Flex Cable (Unplugged)

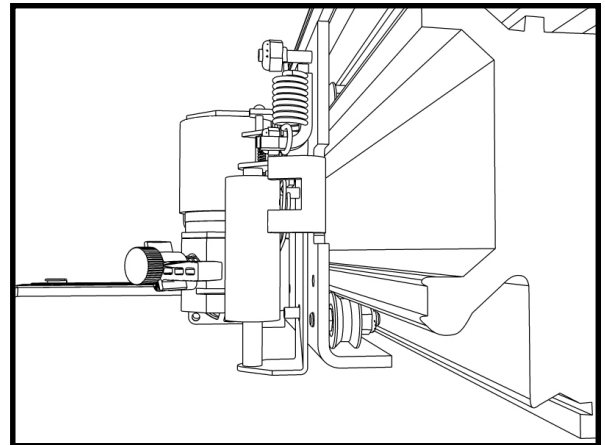
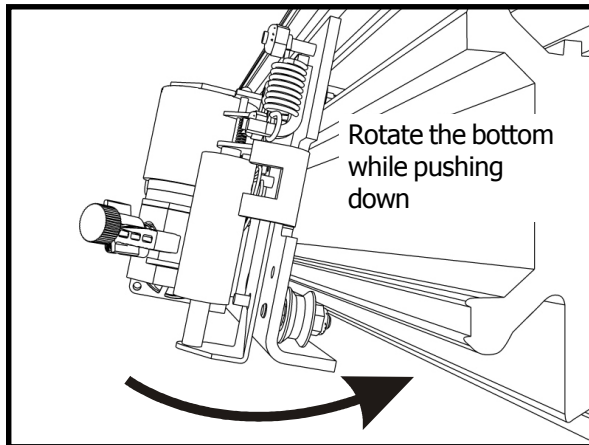
Note: If you are replacing the Flex cable, move on to the next section "Removing the flex cable"

### **Step 3. - Install the new Carriage**

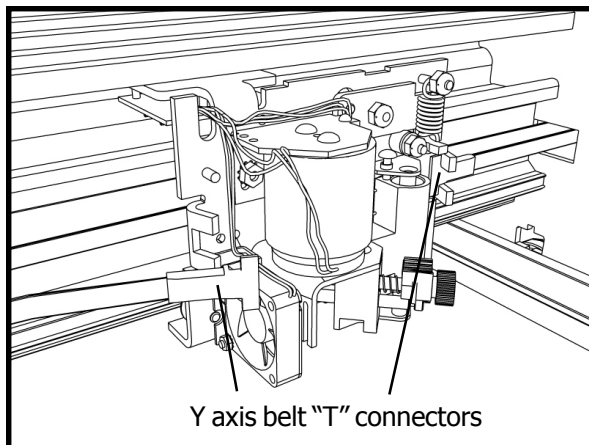
1. Plug the Flex cable into the socket on the new carriage. Thread the cable through the plastic strap being sure to fully plug the cable in. Be sure the colored side (Black or Blue) is facing "UP" when it's connected.



2. Mount the new carriage by aligning the upper wheel with the upper rail, push down on the belt attachment fingers, then slip the lower wheels onto the bottom rail and let the carriage rest.

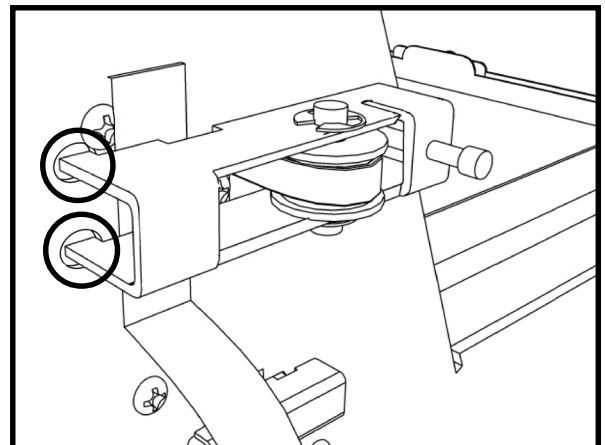


3. Hook the metal “T” connectors into the “Fingers” on the front of the carriage body.



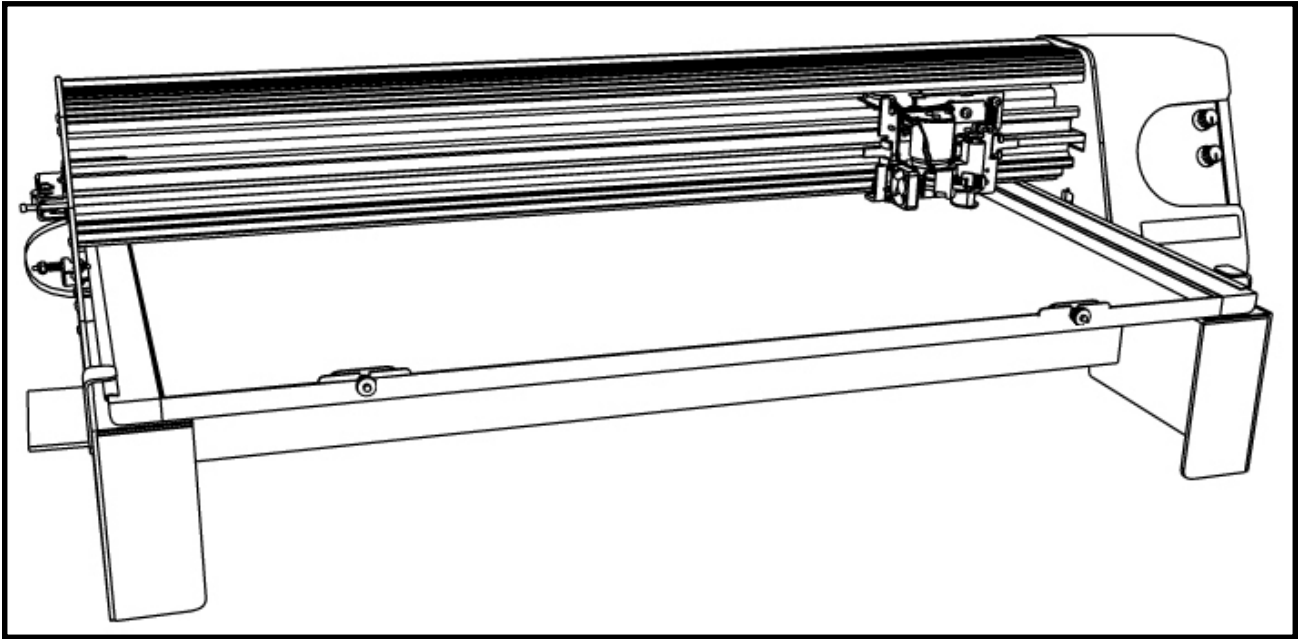
Re-attach the Y axis belt clips

4. Align the tensioner assembly with the indentations on the left end plate

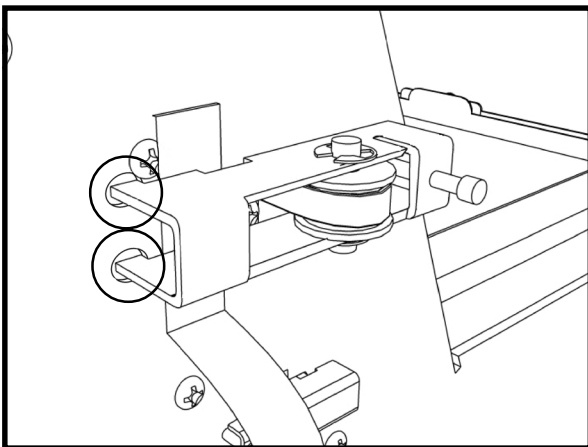


Indentations in the left plate

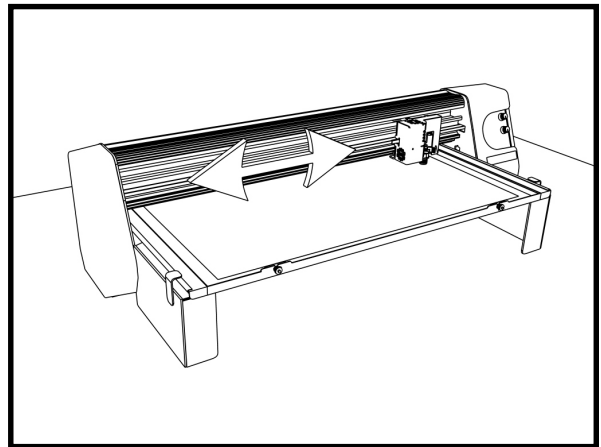
5. Move the carriage to the far right closest to the keypad.



6. Make sure all three points of the belt tensioner are in the indentations correctly as you tighten the 9/64" hex screw on the belt tensioner. Tighten the screw until you reach the "White-Out" mark on the screw.



7. Move the carriage assembly back and forth (by hand) to make sure there is free movement. The carriage should move back and forth very smoothly, and the belt should have a moderate amount of tension. If the belt is still loose turn the screw clockwise 1/4 turn.



8. Plug the power cord into the machine and perform test cuts. If problems arise, contact Ioline Customer Service.

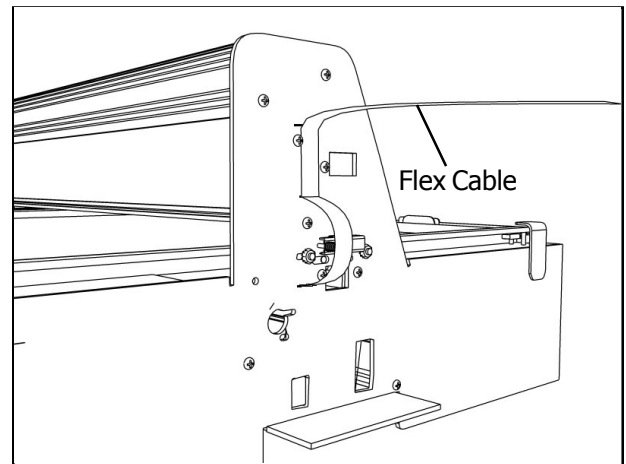
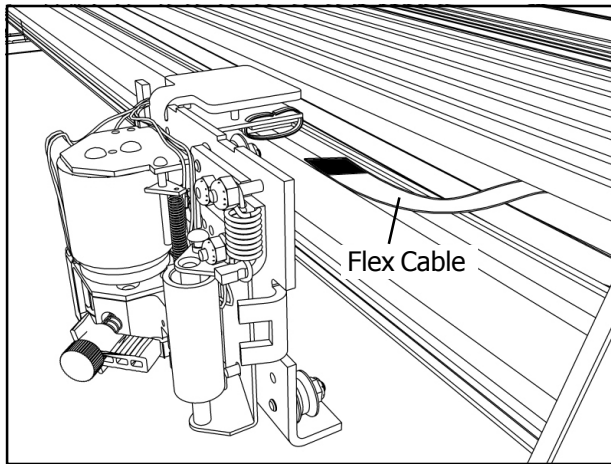
### Replacing the Carriage Flex Cable:

#### Preliminary

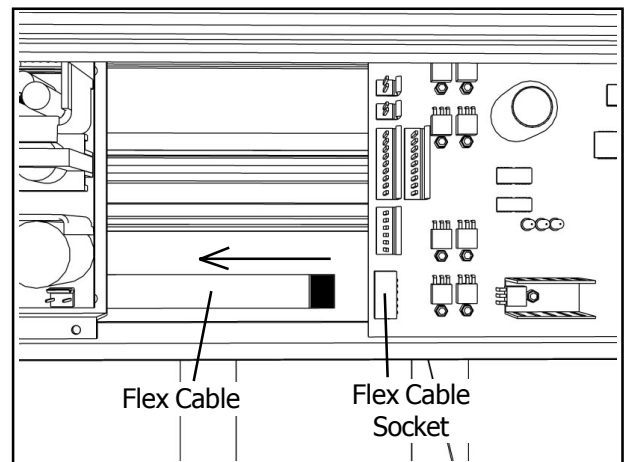
1. Shut off the plotter and remove the power and computer data cable.
2. Remove the left (2 screws) end cover. See *Removing the End Covers earlier in this chapter.*
3. Perform the procedures in *Removing the Bottom Cover for Internal Access earlier in this chapter.*
4. Perform the procedures in *Replacing and removing the carriage earlier in this chapter.*

#### Removing the Flex Cable

1. Disconnect the flex cable from the carriage by pulling the flex cable from the socket. The flex cable is fragile so be very careful when loosening it.
2. Gently pull the flex cable out of the channel and out the left side. A piece of two sided foam tape holds the cable down so take care while removing.

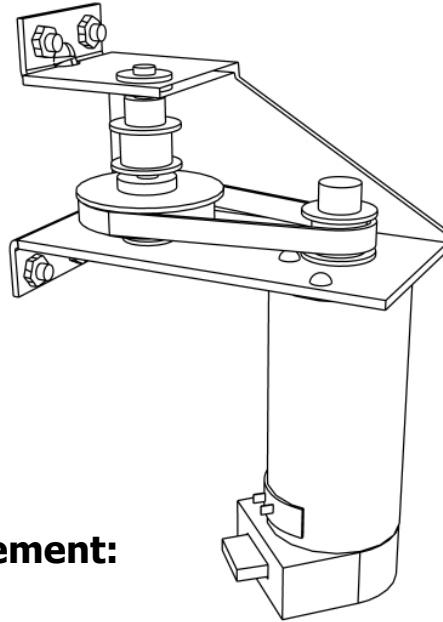


3. Disconnect the flex cable from the logic board by gently pulling it from the socket. **Note:** Notice the colored end of the cable is visible when it's plugged in. Make sure it's plugged in the same way during installation.
4. Completely remove the flex cable from the machine.



**Removing the Flex Cable Cont...**

5. Install the new ribbon cable by following the instructions in reverse order.
6. If problems arise contact Ioline Customer Service.

**Y Axis Transmission****Y-Axis Transmission Replacement:**

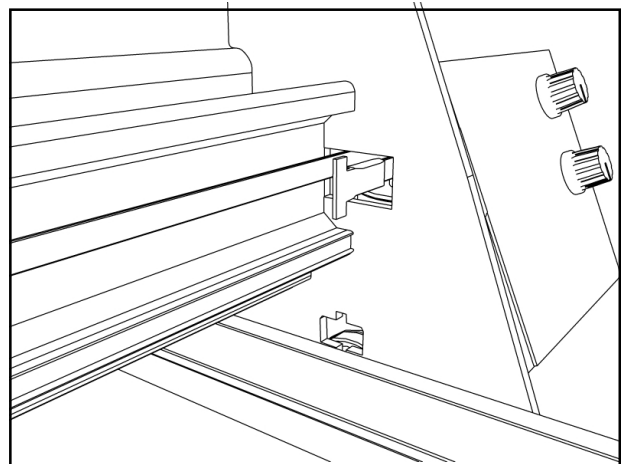
*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

**Step 1: Removing the covers**

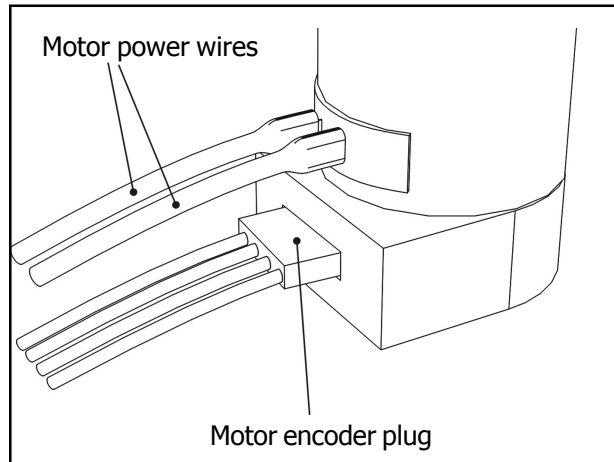
1. Shut off the plotter and remove the power and computer data cables.
2. Remove the Right & left end covers. See *Removing the End Covers* earlier in this chapter.
3. Remove the Carriage assembly. See *Removing the carriage* earlier in this chapter.

**Step 2: Removing the transmission**

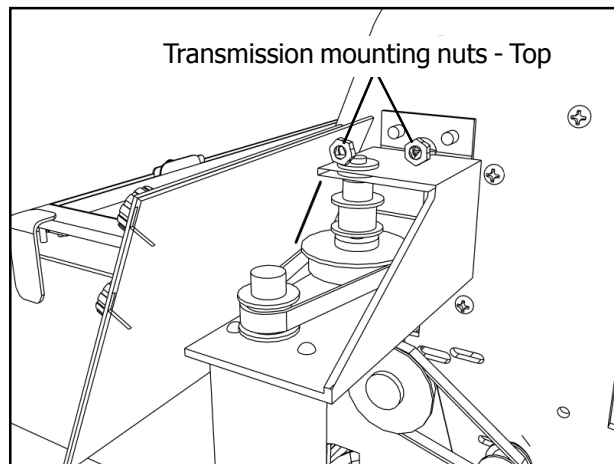
1. Pull the Y Axis belt through the holes in the right end plate. The belt may have to be threaded through the pulleys in the Y Axis transmission.



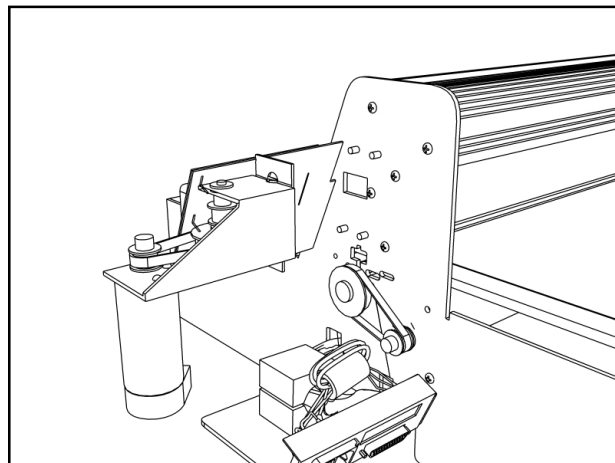
5. Disconnect the motor power cables (Yellow and Black), and the encoder plug-in from the base of the motor.



6. Loosen and remove the four 11/32" nuts that hold the Y Axis transmission onto the machine.



7. Remove the transmission assembly from the machine.
8. Install the new transmission by following the instructions in reverse order.



If problems arise contact Ioline Tech Support.

**Y Axis Motor Replacement:**

*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover. See *Removing the End Covers*.
3. Disconnect the motor power, and motor encoder wires from the base of the motor.
4. With a 9/64" HEX wrench, loosen the two HEX setscrews on the motor gear pulley.
5. With a 1/8" HEX wrench, remove the three black HEX screws at the base of the gear pulley.
6. Carefully slide the gear pulley off the motor shaft, and remove the motor from the transmission housing. Sometimes the pulley can be hard to remove, you may need to pry the pulley off the motor shaft.
7. Follow the procedures in reverse order to remount the new motor, then adjust the belt tension. See *Replacing the Y axis belt*.
8. If problems arise contact Ioline Tech Support.

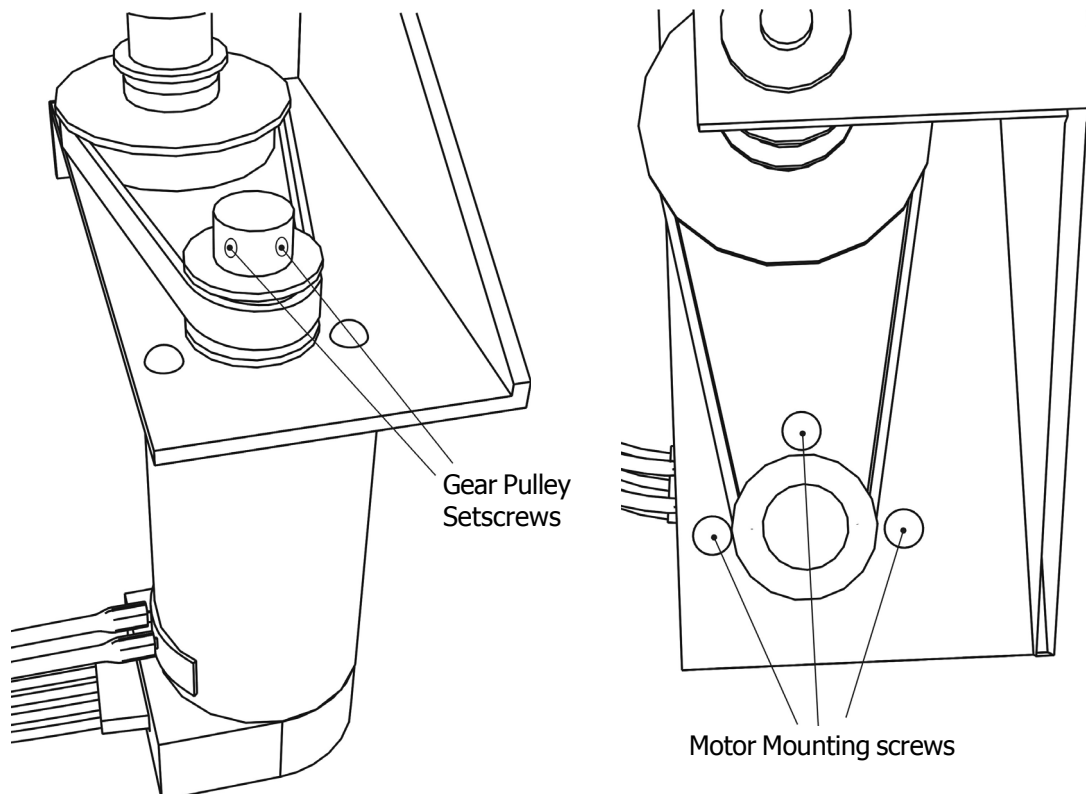
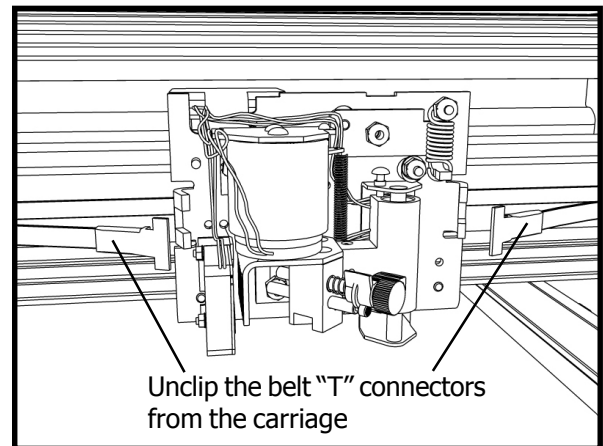
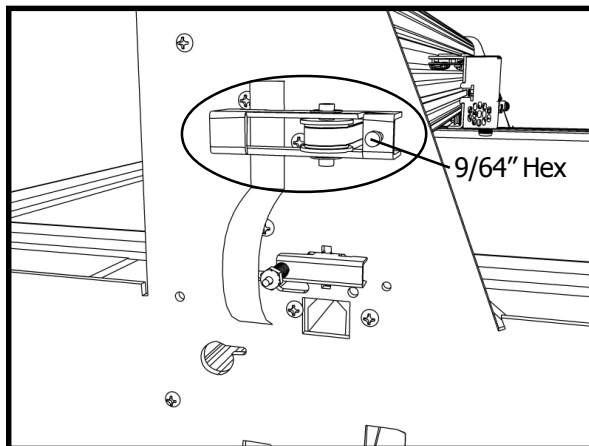


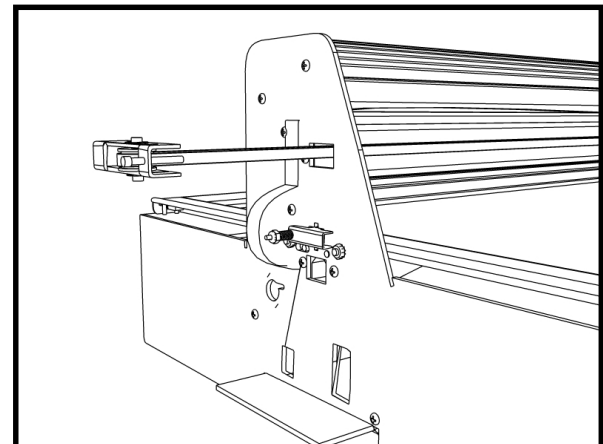
**Fig. 5-8** Motor mounting screws, and gear setscrews

### Y Axis belt replacement

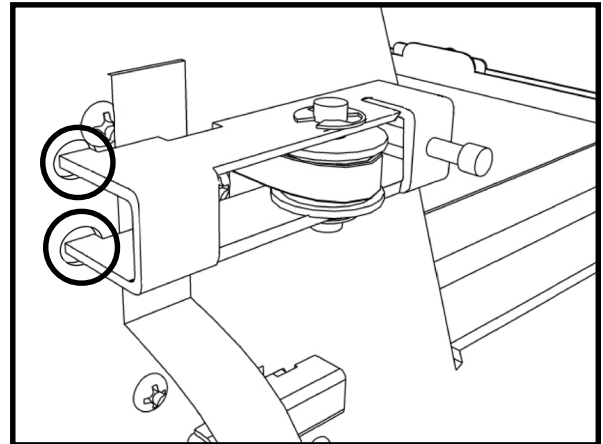
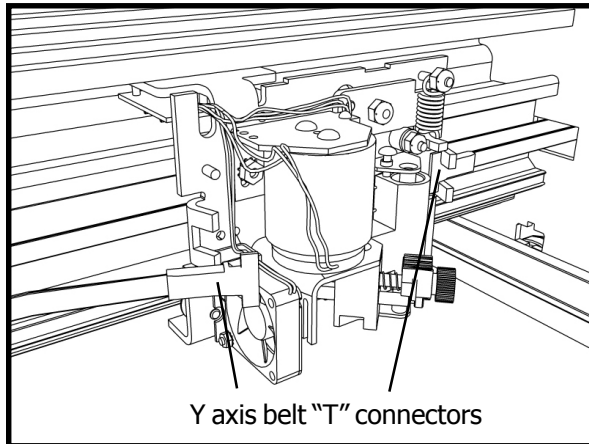
1. Shut off the cutter and remove the power and computer data cables.
2. Remove the right (3 screws) and left (2 screws) end covers. See *Removing the End Covers* earlier in this chapter.
3. Remove the blade holder from the carriage. Mark the screw on the Y axis belt tensioner with "White-Out" to mark the position of the screw before you loosen it. Loosen the allen screw on the belt tensioner until the bracket is flat against the end plate. Do not remove the screw.
4. Grasp one of the metal "T"-connectors on the end of the Y Axis belt and pull it toward the center of the carriage until it pops free. Make sure that the tensioner assembly is not tangled in the belt. Remove the other end of the belt from the carriage.



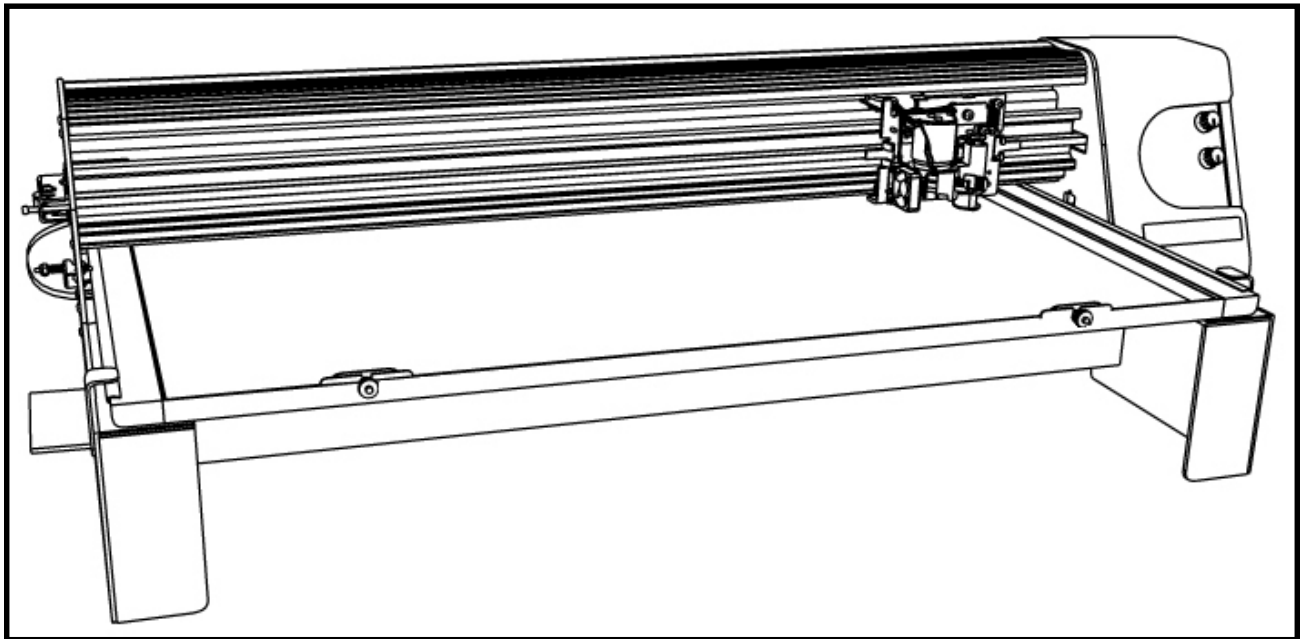
5. Pull the Y Axis belt through the holes in the left end plate. The belt will have to be threaded through the tensioner assembly. Once the belt is removed the tensioner assembly will have to be set aside because it is not attached to the end plate.



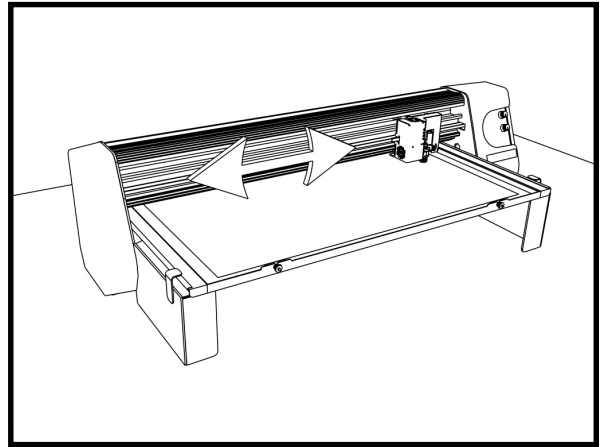
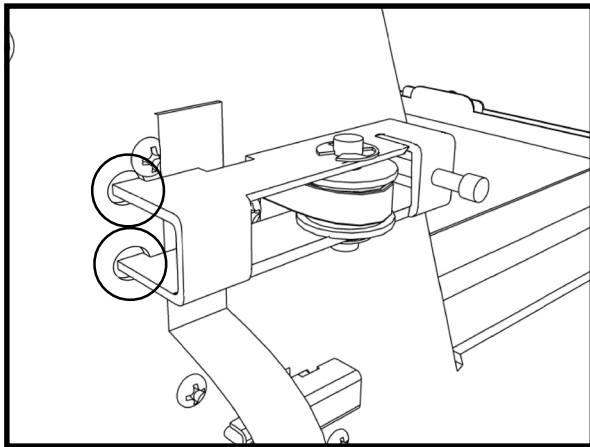
4. Install the new belt through the belt tensioner, and the Y axis transmission. Hook the metal “T” connectors into the “Fingers” on the front of the carriage body.
5. Align the tensioner assembly with the indentations on the left end plate



6. Move the carriage to the far right closest to the keypad.



7. Make sure all three points of the belt tensioner are in the indentations correctly as you tighten the 9/64" hex screw on the belt tensioner. Tighten the screw until you reach the "White-Out" mark on the screw.
8. Move the carriage assembly back and forth (by hand) to make sure there is free movement. The carriage should move back and forth very smoothly, and the belt should have a moderate amount of tension. If the belt is still loose turn the screw clockwise 1/4 turn.



9. Slide the carriage back and forth by hand. If you feel slipping the belt is too loose. If you hear "Clicking", the belt is too tight.
10. Plug the power cord into the machine and perform test cuts. If problems arise, contact Ioline Customer Service.

### X Axis Subsystem

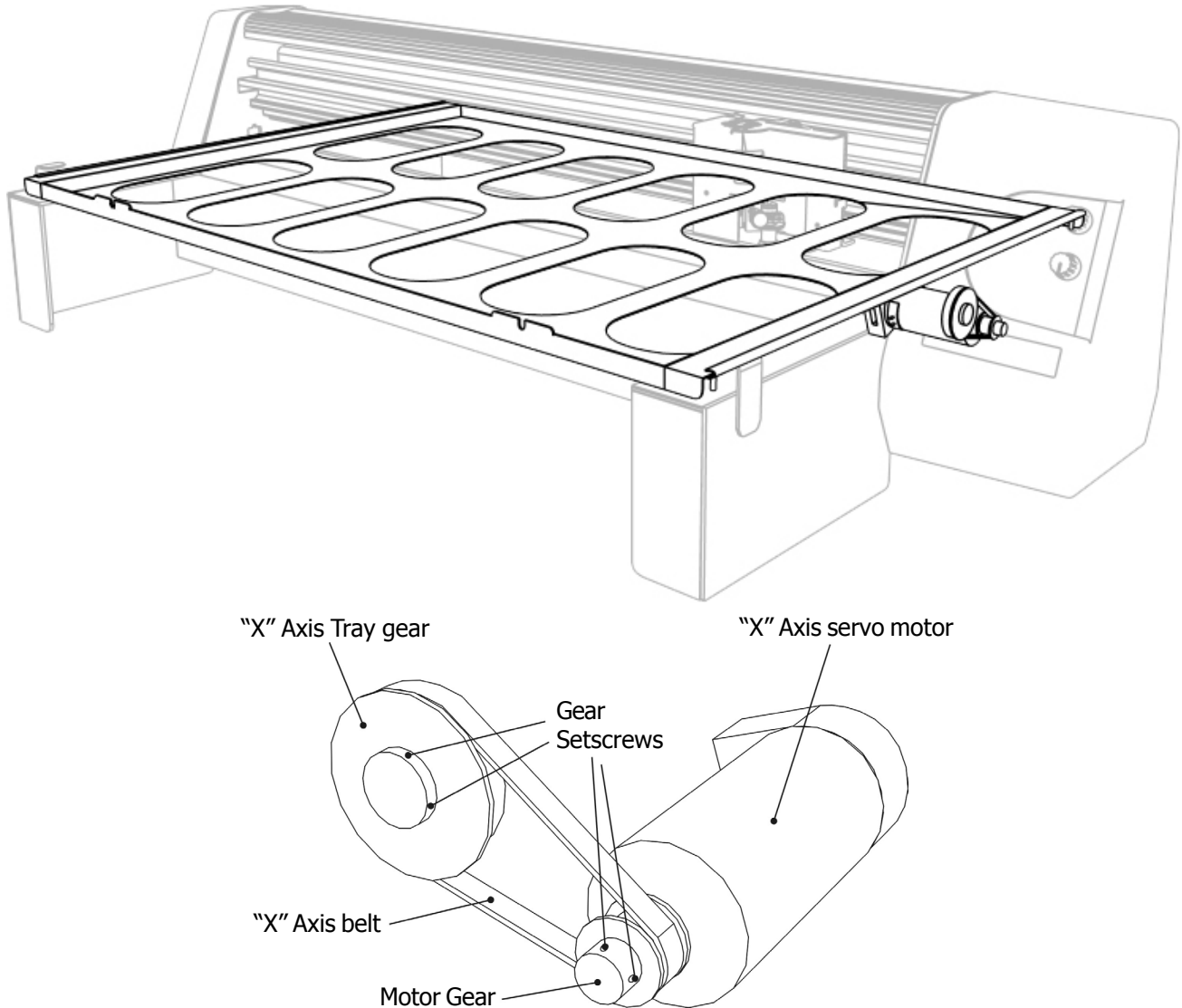
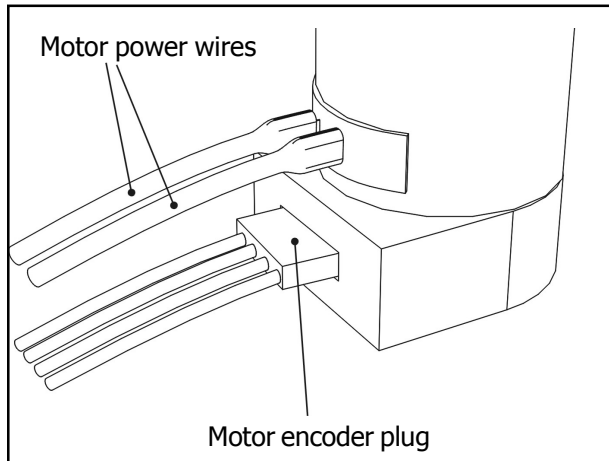


**Fig. 5-11** "X" Axis motor, gears, and belt

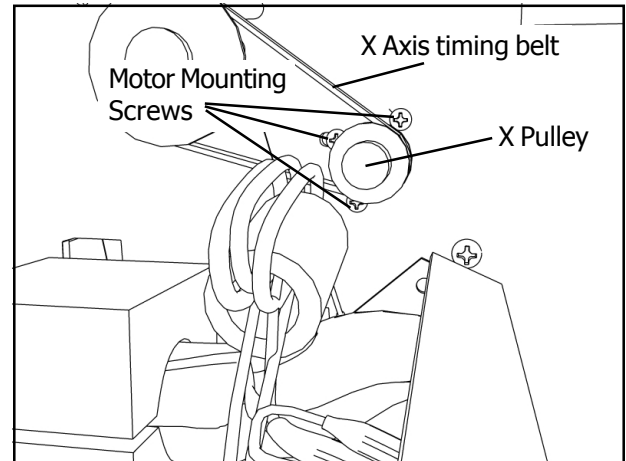
#### X Axis Motor Replacement:

1. Shut off the cutter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover. *See Removing the End Covers.*
3. Perform the procedures in *Removing the Bottom Cover for Internal Access.*
4. Discharge any static electricity that has accumulated and remove all of the plugs on the logic board. Use the *Interconnect Diagram* in the *Appendix* section to find all of the connections.

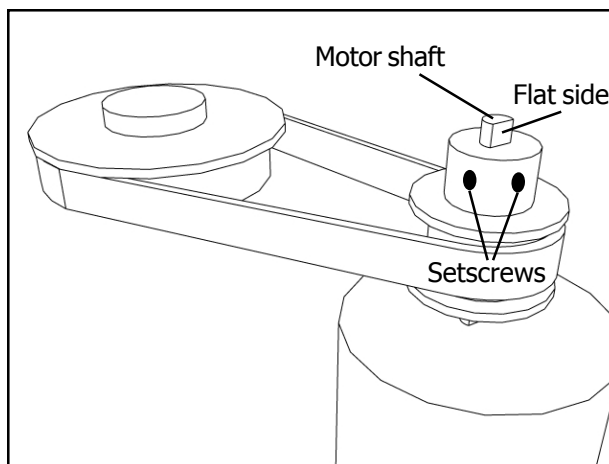
6. Disconnect the motor power cables (Red and black) from the base of the motor, and the black encoder plug with 4 wires at the base of the motor.



7. Remove the motor pulley and belt. Loosen and remove the three phillips head screws that hold the motor on the end plate.



8. Replace the motor and attach the pulley and belt. When tightening the set screws make sure that one set screw contacts the shaft on the flat machined surface.



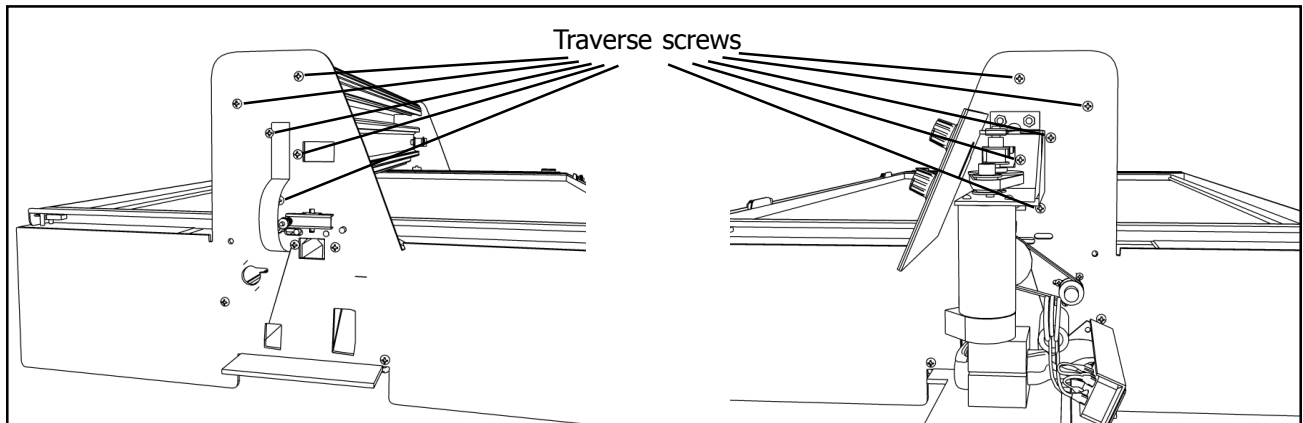
9. Reconnect the power wires making sure the red is plugged into the positive terminal and the Black is plugged into the negative terminal.
10. Follow the instructions in reverse order to re-assemble the machine. If you encounter any problems contact Ioline Customer Service.

## Table Assembly Replacement

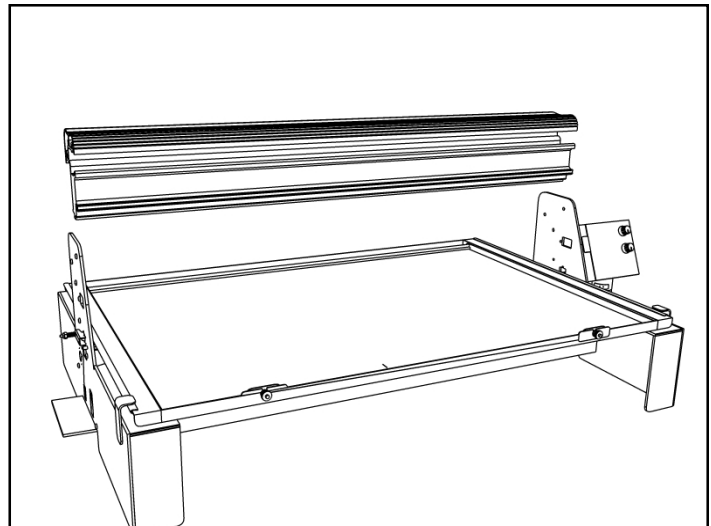


*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) and left (2 screws) end covers. *See Removing the End Covers.*
3. Perform the procedures in *Replacing and removing the carriage earlier in this chapter.*
4. Remove the traverse from the machine by removing the traverse mounting screws on the right and left side of the machine.



5. Remove the traverse from the machine and set it aside.



6. Loosen the (2) 11/32" nuts located on either side of the "X" axis tray gear. *Don't remove them. See Fig. 5-12*

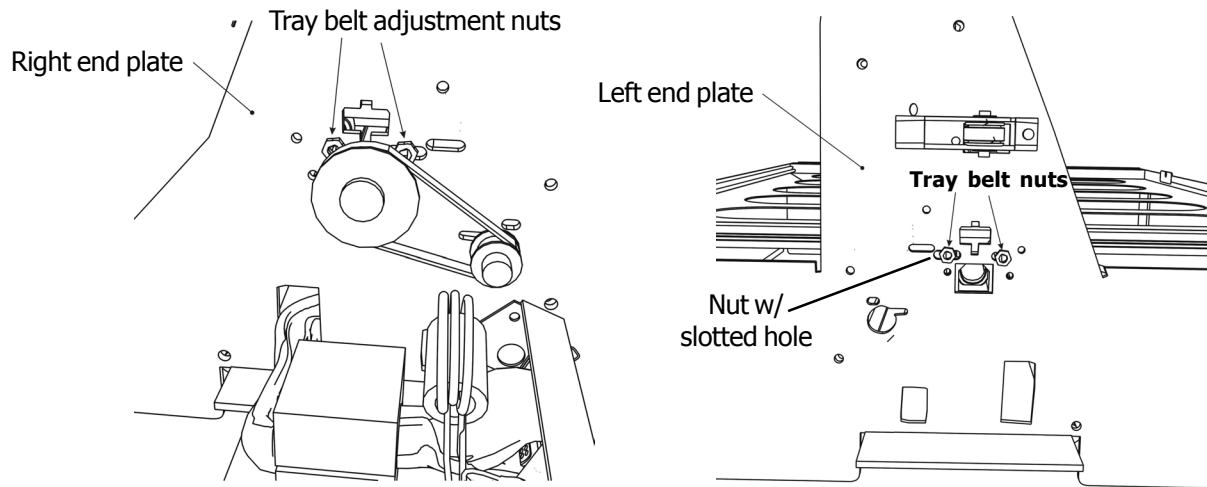


**Fig. 5-12** Right and left end plates showing tray adjustment nuts

7. Unclip the belts under the right, and left side of the tray (One on each corner of the table). *See Fig. 5-13*

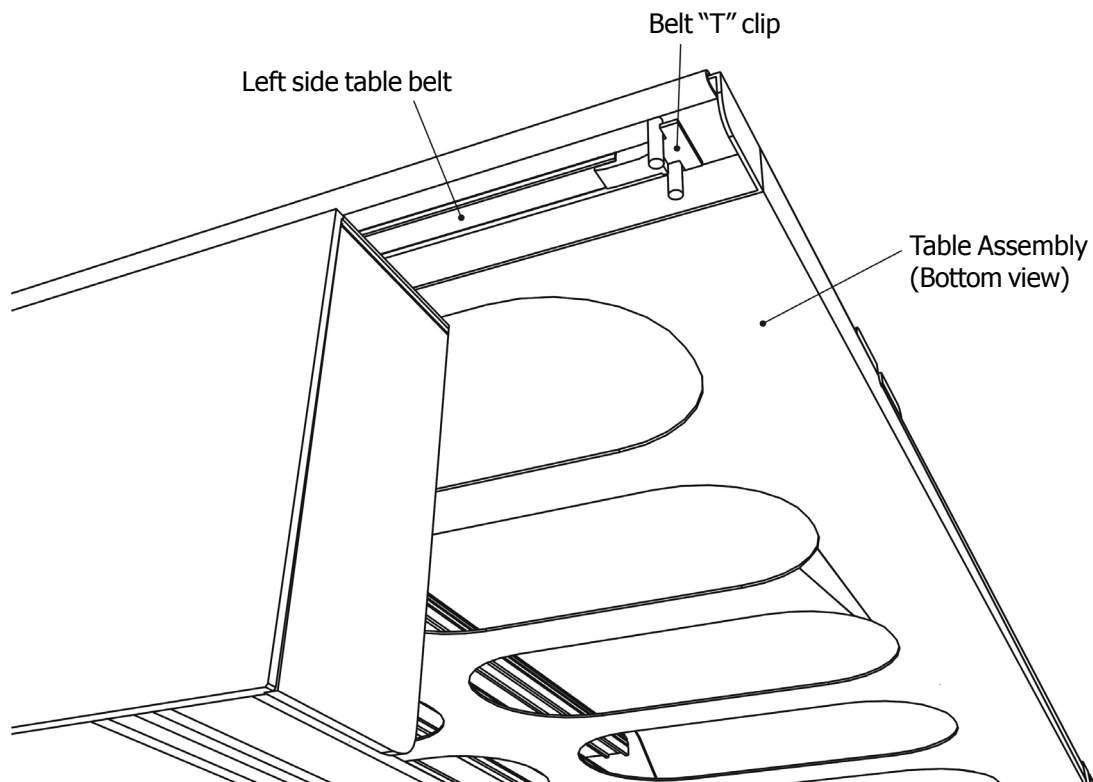
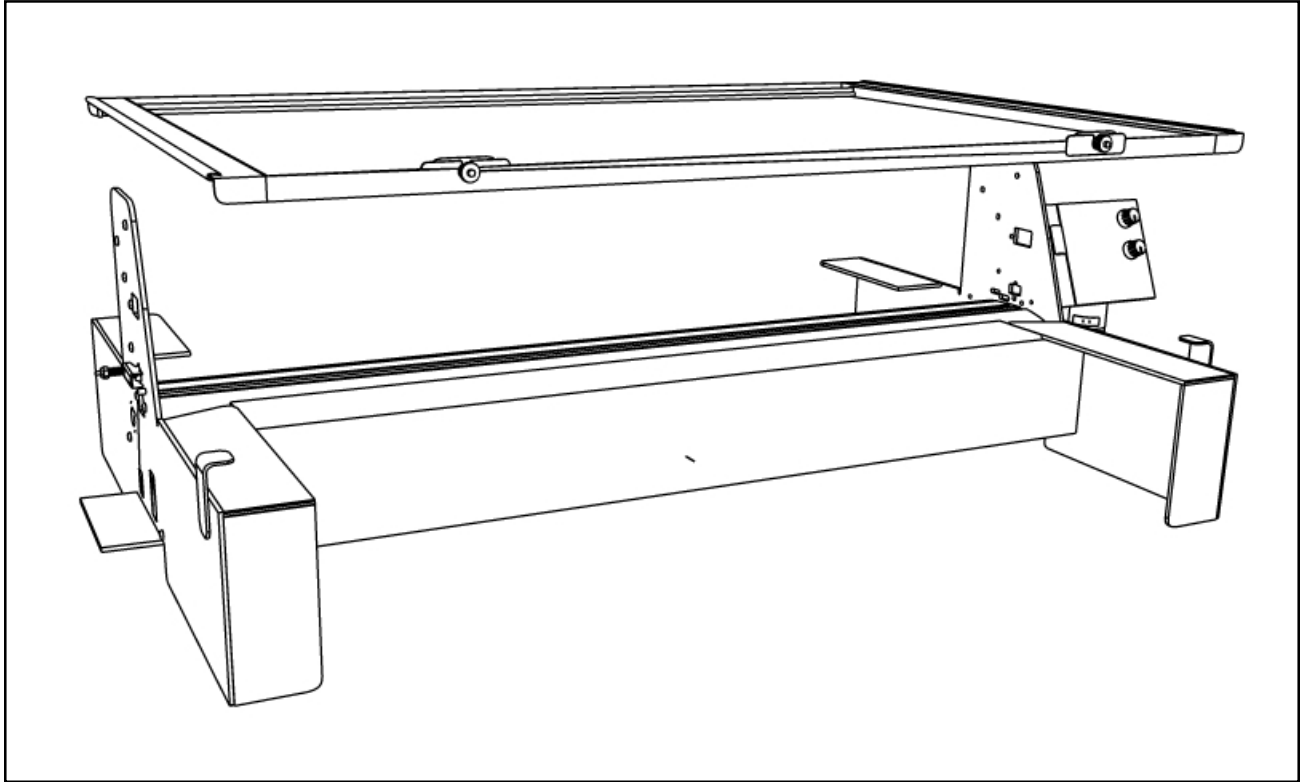


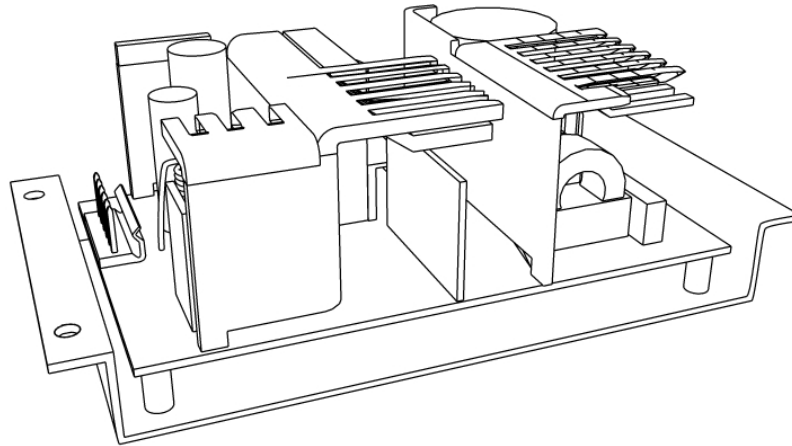
**Fig. 5-13** Tray clip (Left front clip shown with nuts removed).

8. Remove the table assembly from the cutter by pushing the table toward the left side of the machine. There is a spring loaded wheel on the left, and a fixed wheel on the right.



9. Follow the instructions in reverse order to install the new table assembly. If problems arise contact Ioline Customer Service.

## Power Supply

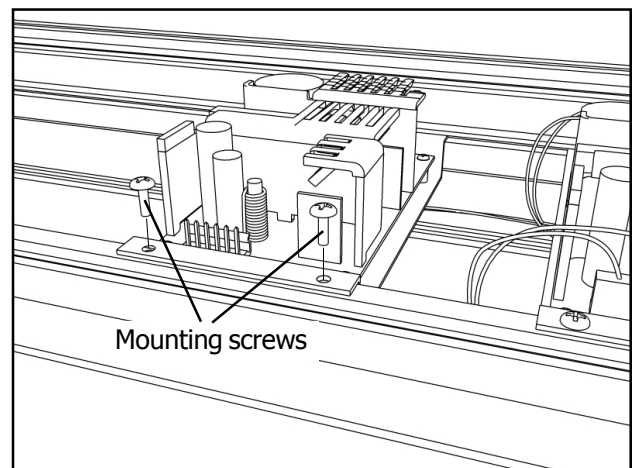
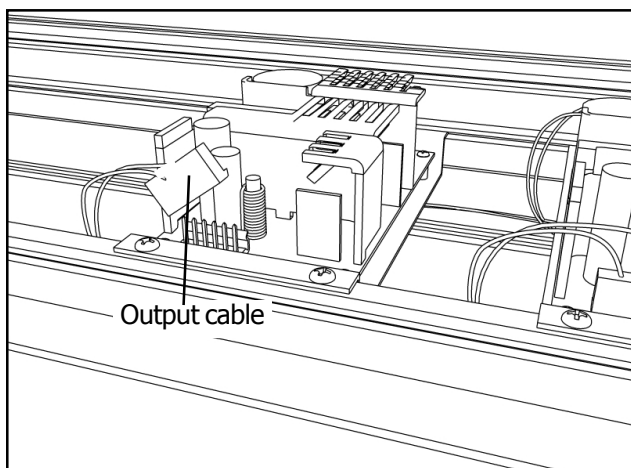


### Power Supply Replacement

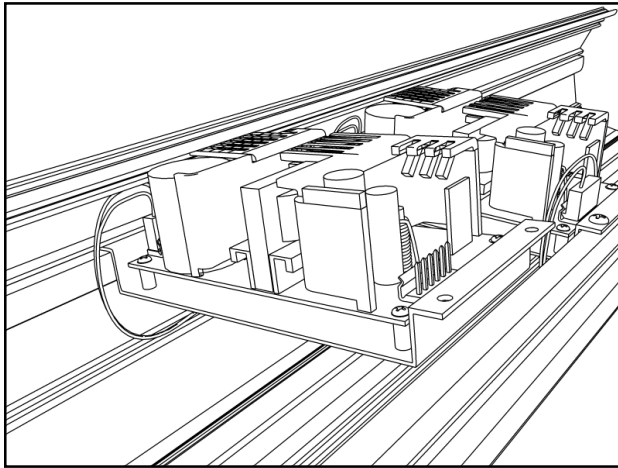


*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

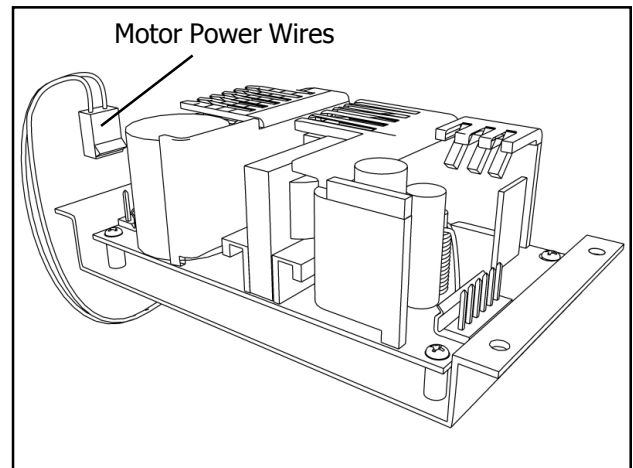
1. Shut off the plotter and remove the power and computer data cable.
2. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
3. Discharge any static electricity that has accumulated and unplug the output cable on the logic board. Use the *Interconnect Diagram* in the *Appendix* section as a location guide.
4. Remove the two screws that hold the power supply in the machine.



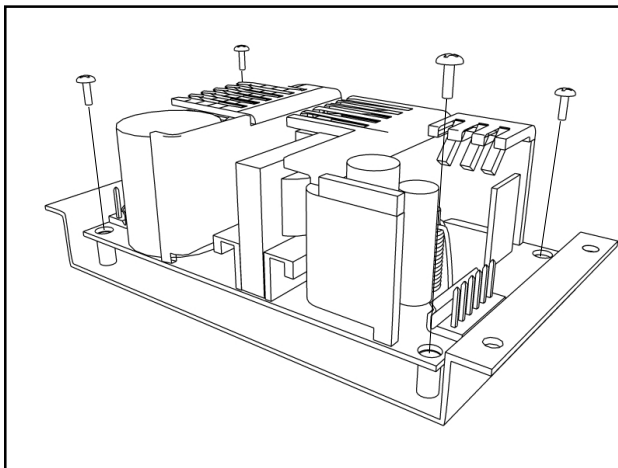
4. Remove the power supply assembly from the machine.



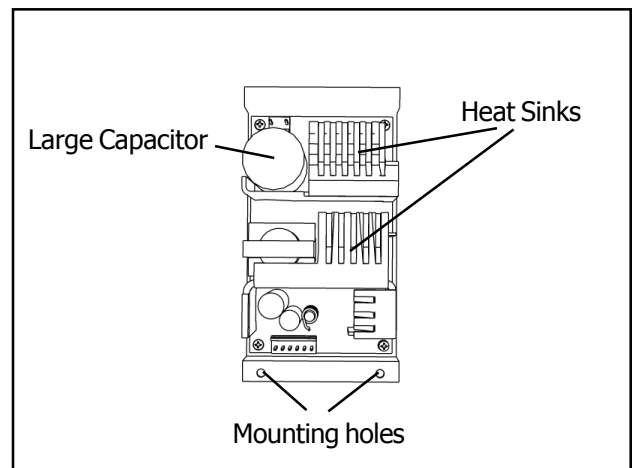
5. Remove the motor power wires from the power supply (Brown & Blue color).



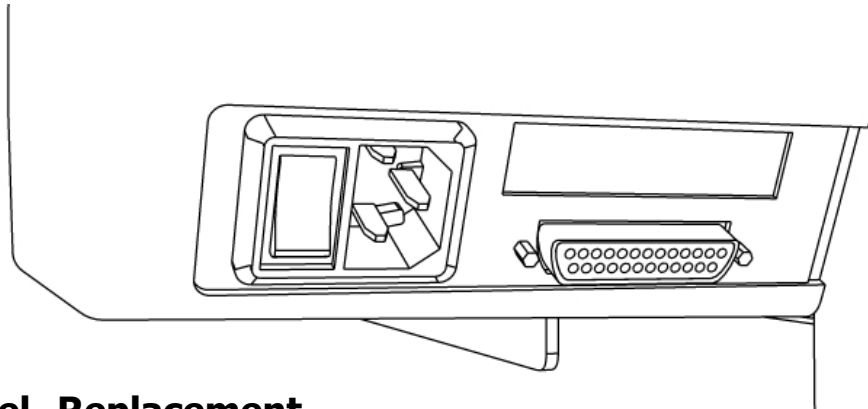
6. Remove the 4 Power supply mounting screws.



7. Install the new power supply. Make sure it is oriented the same way as in the picture.



9. To install the power supply follow the instructions in reverse order. If problems arise contact Ioline customer service.

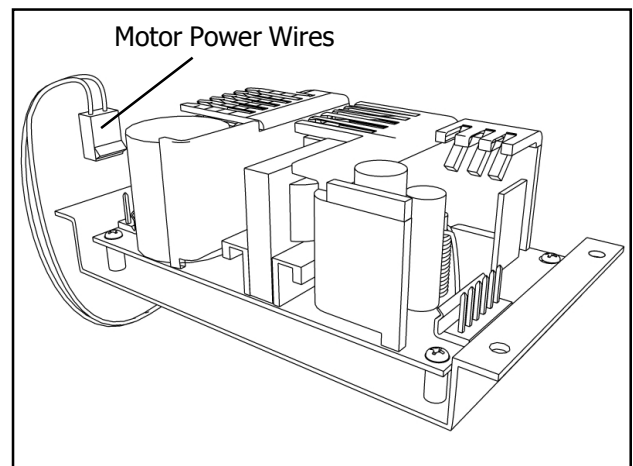
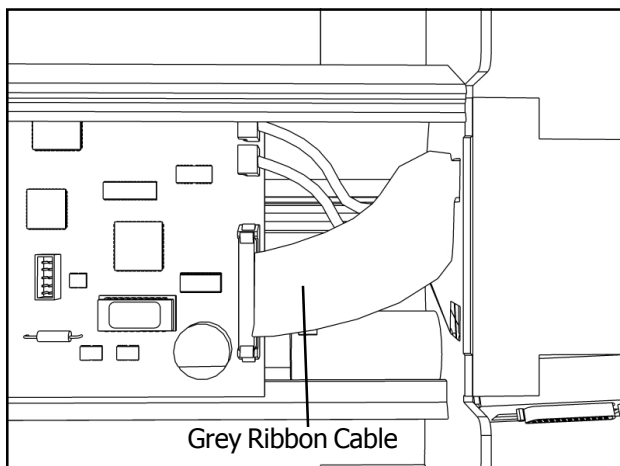


### Rear Panel Replacement

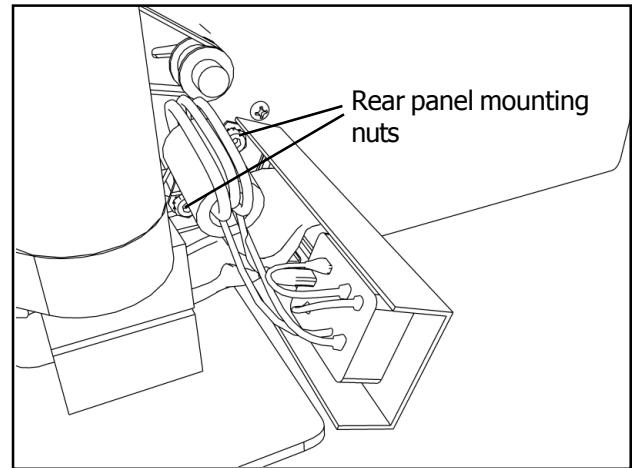
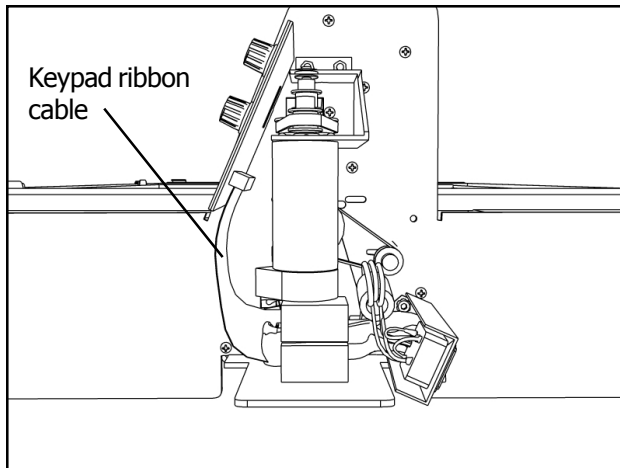


*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover by following the *Removing end covers* earlier in this chapter.
3. Perform the procedures in *Removing the Bottom Cover for Internal Access* earlier in this chapter.
4. Cut plastic cable ties around wires.
5. Remove the grey ribbon cable (blue socket at J2 near the right end plate) by pushing the blue tabs away from the center of the connector. The plug should be easy to pull out.
6. Unplug the motor power wires from both power supplies (Brown and Blue wires) located on the side away from the logic board.

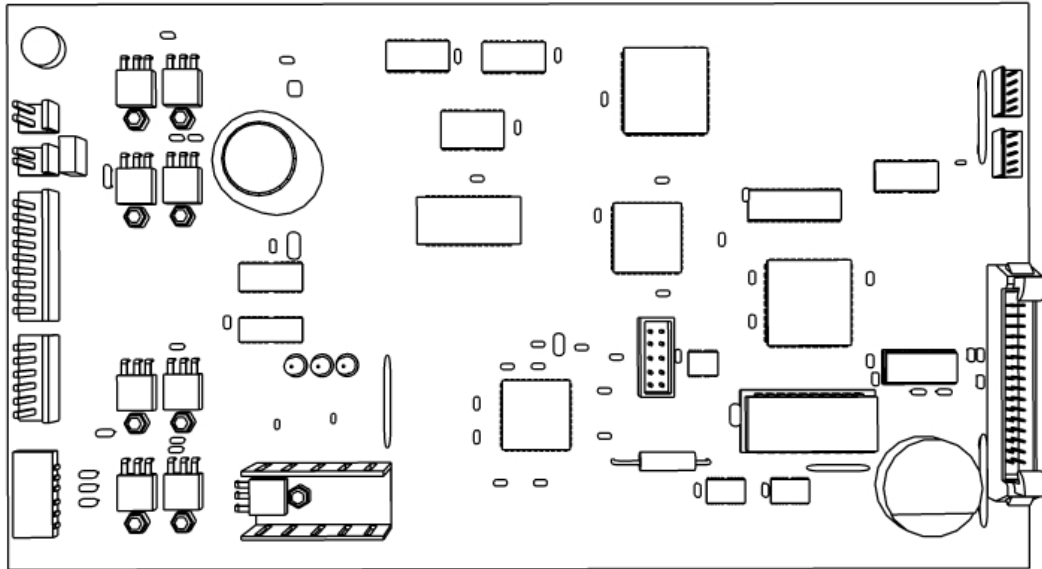


6. Pull the wires through the hole in the end plate. The encoder wires may have to be moved out of the way.
7. Disconnect the gray ribbon cable from keypad circuit board connector. Cut the cable tie that holds the wire bundle to the ground wire.
8. Remove the two nuts holding the rear panel assembly to the right end plate. Remove the rear panel assembly from the machine.



9. Follow the instructions in reverse order to install the new rear panel. If problems arise contact Ioline Customer Service.

## Electronic Sub-Systems



### Main Logic Board Replacement



*Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.*

1. Shut off the plotter and remove the power and computer data cable.
2. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
3. Mark all of the main logic board connectors with a felt tip pen before disconnecting them. This will make it easier to correctly install the connectors after inserting the new logic board.
4. Discharge any static electricity that has accumulated and remove all of the plugs and connections on the logic board. Use the *Interconnect Diagram* in the *Appendix* section as a location guide.

5. Remove the logic board by loosening the four phillips head screws and pulling the unit out of the track in the platen.
6. Replace the new logic board making sure to insert the top edge into the support track in the platen. Insert and tighten the four phillips screws from above. The fasteners only need to be snug and can damage the logic board if over tightened.
7. Connect all of the plugs on the logic board. Use the *Interconnect Diagram* in the *Appendix* section and the notes from step 4 as a guide.
8. Plug the power cord into the 350HF and into a wall outlet. Power the machine on using the resetting procedure below. Test all of the functions of the keypad.
9. Reconnect the serial cable and perform test plots. Reassemble the 350HF in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
10. If problems arise contact Ioline customer service.

### Resetting the Factory Defaults

If you have replaced the logic board, or the 350HF System is acting wierd, the machine should be reset to factory defaults. There are two ways to restore the factory default system parameters.

| Default Reset Functions                                 | Result                                                                                                                                  |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Hold down the Start/Stop key while turning on the power | Resets all factory parameter defaults but keeps the X/Y calibration values.                                                             |
| Hold down the Up Arrow key while turning on the power   | Resets all factory parameter defaults and clears the X/Y calibration values. This option should only be used when replacing a ROM chip. |

### Keypad Replacement



***Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.***

1. Shut off the plotter and remove the power and computer data cables.
2. Remove the right (3 screws) end cover. See *Removing the End Covers* above.
3. Loosen and remove the two nuts holding the keypad assembly to right end plate.

4. Disconnect the gray ribbon cable from keypad circuit board connector.
5. Remove keypad assembly.
6. Connect the gray ribbon cable to the new keypad assembly with the red stripe (pin 1) on the edge closest to the mounting holes.
7. Fasten the new keypad assembly to the end plate with the hardware from above.
8. Plug the power cord into the 350HF and into a wall outlet. Test all of the keypad keys and make sure that all of the functions are working. When the carriage moves on the traverse extrusion watch the Y Axis belt.
9. Reconnect the serial cable and perform test plots. Reassemble the 350HF in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
10. If problems arise contact Ioline customer service.

### Installing new Firmware



***Failure to follow these directions explicitly may cause permanent damage to the Logic Board and may cause the plotter to malfunction.***

1. Make sure the 350HF cutter is powered on, and the computer data cable is plugged in. Press the “Set Origin” button on the keypad of the cutter.
2. Start the Ioline Control Center. See *Chapter 3 Setup & Operation for help with the Ioline Control Center*.
3. When the Control Center window is open, click on the “Options” drop down menu, and click “Install New Firmware Version”.
4. When the Install new firmware window opens, click on the “Install” button.
5. A dialog box will open asking for the location of the “BIN” file (This file is available through the Ioline webs ite at [www.ioline.com](http://www.ioline.com), or through Ioline Customer Service). Locate the file, and click “OK”.
6. The LED on the keypad of the cutter will blink Red as the new firmware installs.
7. After installation is complete, the Control Center will close automatically, and the 350HF cutter should be turned off, and reset back to factory defaults before sending any files to it. See *Reseting the factory defaults on Pg. 85*.
8. If a problem should arise, and the cutter won’t power up after installation of the new firmware contact Ioline Customer Service for instructions.



## **Chapter 6 Drawings, and Bulletins**

## 106708

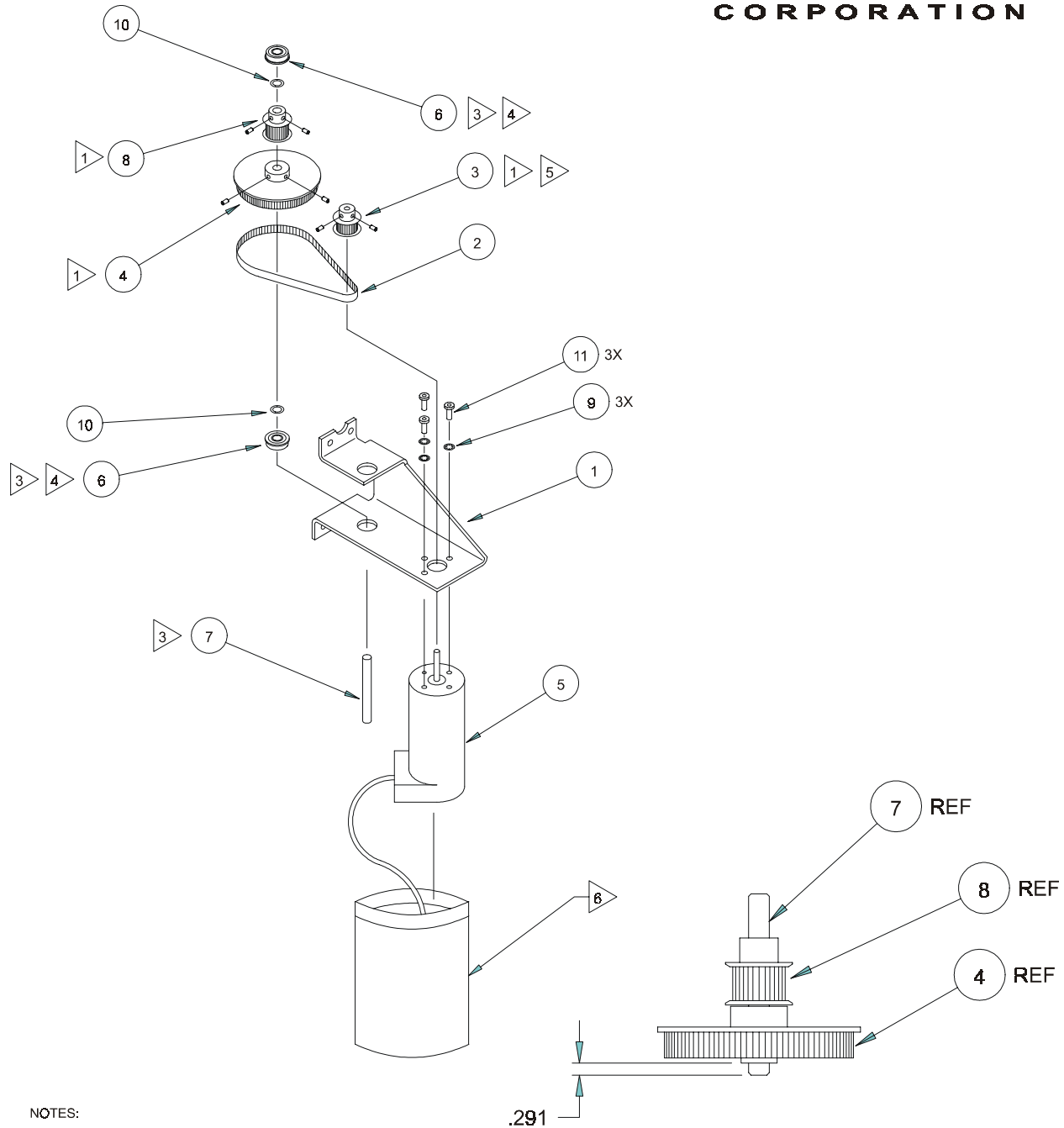


**Belt Tensioner (Bill of materials)**

| <b>Drawing Number</b> | <b>Component Part Number</b> | <b>Component Description</b>        | <b>Quantity Used</b> |
|-----------------------|------------------------------|-------------------------------------|----------------------|
| 2                     | 106698                       | BRACKET, TENSIONER, SC98            | 1                    |
| 3                     | 106696                       | IDLER, TENSIONER, I/S               | 1                    |
| 4                     | 106431                       | SHAFT, .25OD, TENSIONER, SC98       | 1                    |
| 5                     | 103825                       | SPACER, SHAFT                       | 2                    |
| 8                     | 100316                       | BEARING, BALL, .25ID, .625OD, .196  | 2                    |
| 6                     | 102222                       | RING, RETAINING, E-CLIP, 1/4        | 2                    |
| 7                     | 100046                       | SCREW #8-32, 1.25 LG, SHC, FULL THD | 1                    |

# "Y" Axis Transmission

106817



## NOTES:

- 1 SECURE ALL PULLEY SET SCREWS WITH LOCTITE 222. BE SURE ONE SET SCREW IS AGAINST FLAT ON SHAFT.
- 3 CLEAN MATING SURFACES OF BEARINGS, ITEM 6, AND BRACKET, ITEM 1, WITH LOCTITE PRIMER N. SECURE BEARINGS TO PLATES WITH LOCTITE 609.
- 4 ADD A SMALL AMOUNT OF LOCTITE THREAD LOCKER 290 TO INNER RACE ID OF BEARINGS, ITEM 6. CAUTION: ID OF BEARINGS, ITEM 6. WIPE OFF ALL EXCESS LOCTITE. DO NOT ALLOW ANY TO GET INSIDE BEARING.
- 5 INSTALL PULLEY SO THAT THE GAP BETWEEN THE PULLEY FLANGE AND BRACKET IS  $.100 \pm .010$ .
- 6 MOTOR, ITEM 5, IS STATIC SENSITIVE. COVER MOTOR AND CONNECTOR WITH 3 X 5 STATIC BAG AND SECURE WITH A RUBBER BAND.



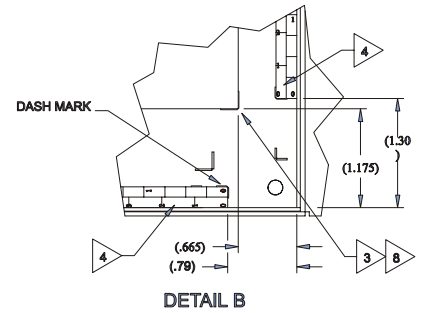
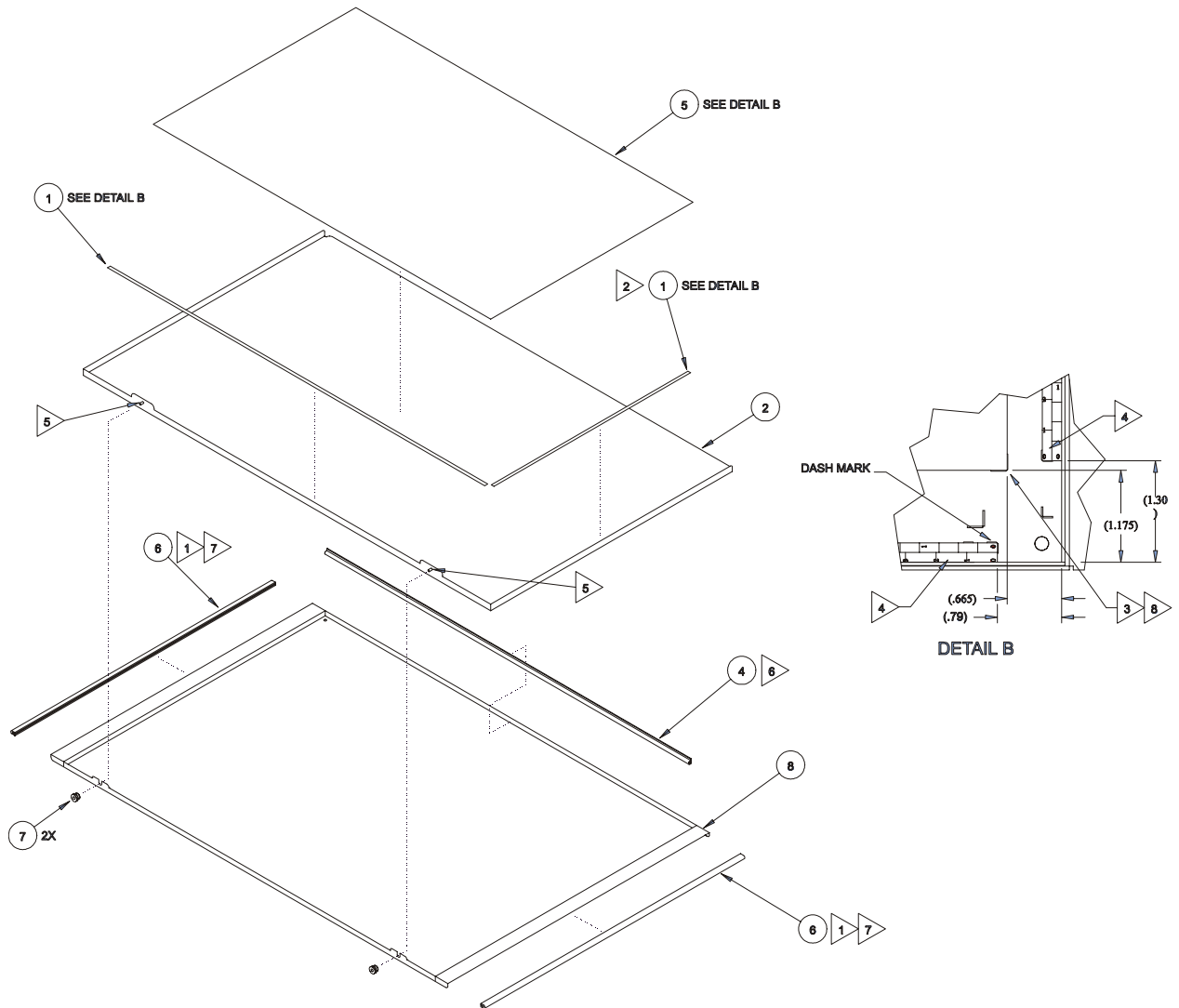
**CAUTION**  
SENSITIVE ELECTRONIC DEVICES

DO NOT SHIP OR STORE NEAR STRONG  
ELECTROSTATIC, ELECTROMAGNETIC,  
MAGNETIC OR RADIOACTIVE FIELDS

**“Y” axis Transmission (Bill of Materials)**

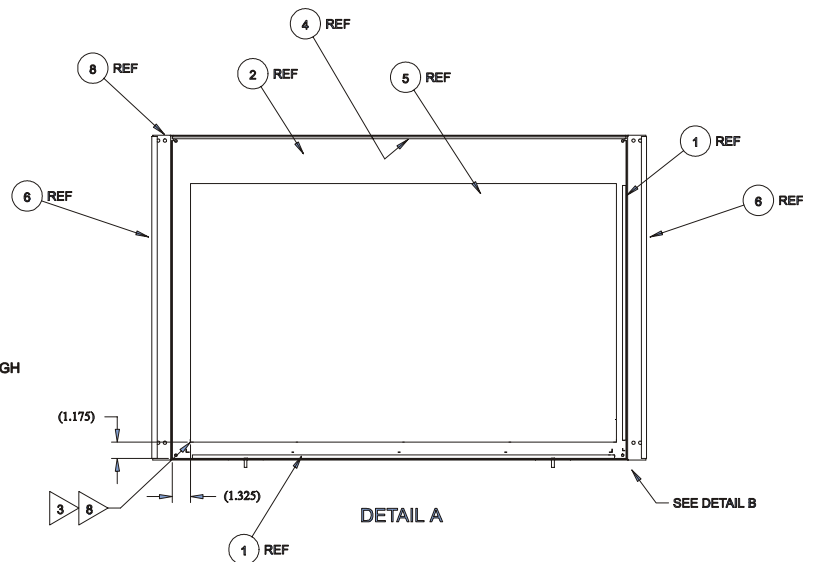
| <b>Drawing Number</b> | <b>Component Part Number</b> | <b>Component Description</b>        | <b>Quantity Used</b> |
|-----------------------|------------------------------|-------------------------------------|----------------------|
| 1                     | 105935                       | BRACKET, Y TRANS, SUMMIT 97         | 1                    |
| 2                     | 105953                       | BELT, .080 X 1/4 X 110T             | 1                    |
| 3                     | 105933                       | PULLEY, 16T X .080 X 1/4            | 1                    |
| 3                     | 107346                       | PULLEY, 5MM BORE, 16T X .080 X 1/4  | 1                    |
| 4                     | 105934                       | PULLEY, 60T X .080 X 1/4            | 1                    |
| 5                     | 106816                       | MOTOR, SERVO, 24V                   | 1                    |
| 5                     | 107347                       | MOTOR, 5MM SHAFT, SERVO, 24V        | 1                    |
| 6                     | 100317                       | BEARING, BALL, .25ID, .625OD, .196  | 2                    |
| 7                     | 104830                       | PIN, Y DRIVE                        | 1                    |
| 8                     | 104730                       | PULLEY, .080 X 3/8 X 25T            | 1                    |
| 9                     | 100080                       | WSHR, #6, LOCK, EXT STAR            | 3                    |
| 10                    | 100111                       | SPACER, .254ID, .375OD, .030LG, GOL | 2                    |
| 11                    | 104975                       | SCREW #6-32, .375 LG, BTN HD        | 3                    |

# Table Assembly 107663



## NOTES:

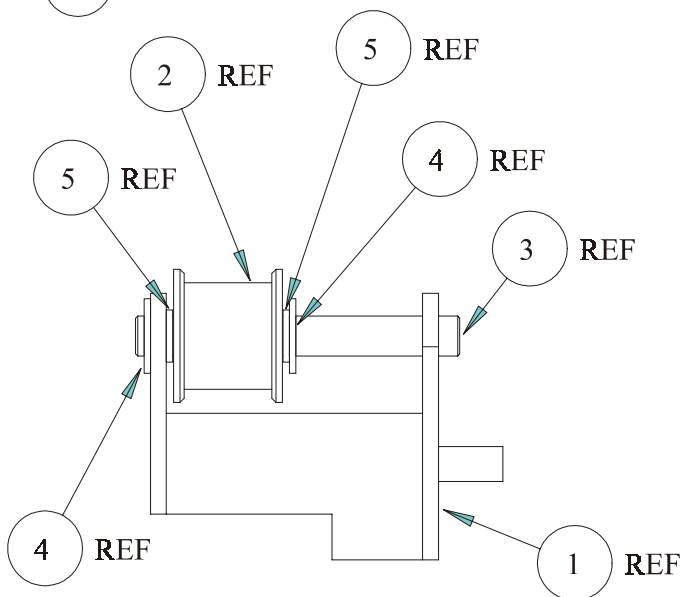
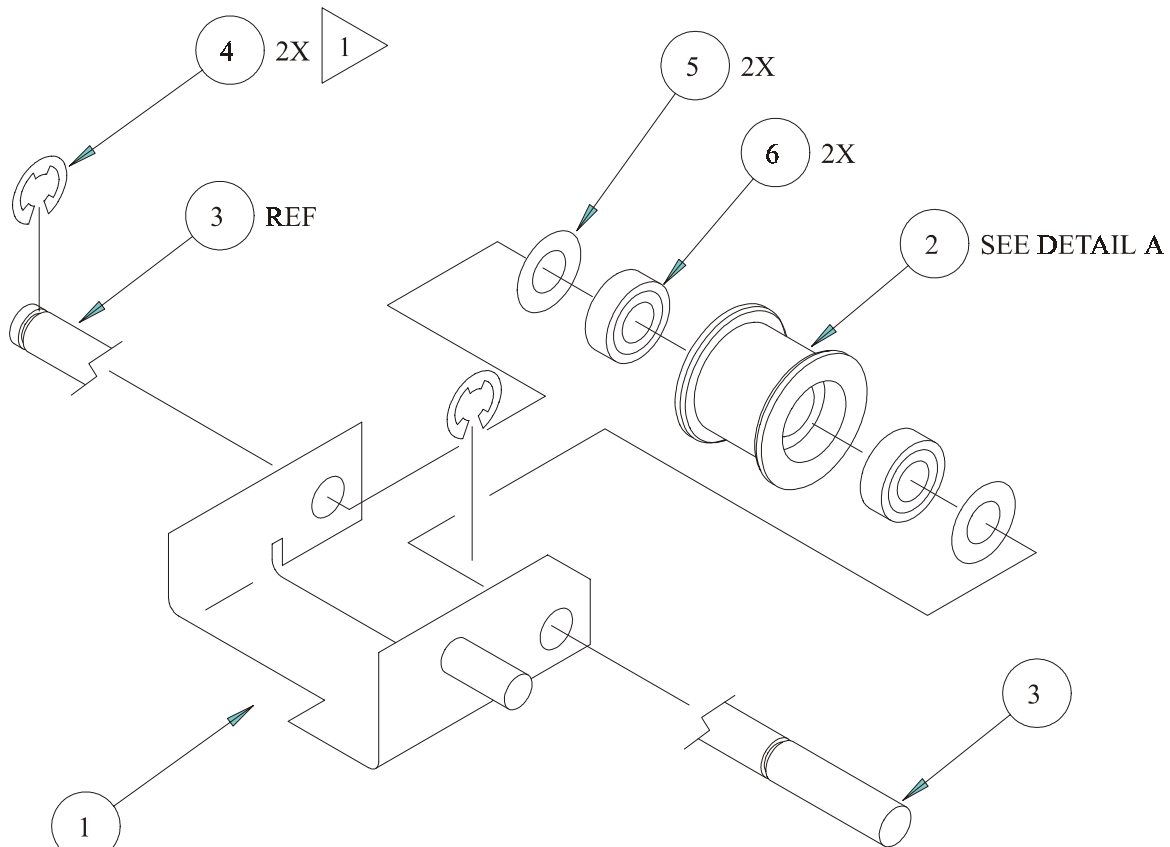
- 1 ADHERE PROTECTIVE STRIP 6 TO TRAY 8 WITH LOCTITE 401.
- 2 CUT TO THE 18.25" MARK ON THE RULER.
- 3 ALIGN CORNERS OF ADHESIVE SHEET 5 TO THE CORNER MARKS ON THE TRAY 2
- 4 ALIGN RULER 1 ALONG THE WALL OF TRAY 2 . POSITION RULER AS SHOWN IN DETAIL B (USING DASH MARKS).
- 5 AFTER THUMB NUT 7 IS TURNED ONTO THE THREADED STUD, CRIMP THREAD WITH PLIERS SO THE THUMB NUT CAN NOT BE REMOVED. (NOTE: THE THUMB NUT MUST BACK OUT FAR ENOUGH TO REMOVE AND INSTALL THE TRAY).
- 6 CUT TO 32.50.
- 7 CUT TO 23.05.
- 8 MAKE DIMPLE USING CENTER PUNCH TOOL IF DASH MARKS ARE MISSING.



### Table Assembly (Bill of Materials)

| Drawing Number | Component Part Number | Component Description            | Quantity Used |
|----------------|-----------------------|----------------------------------|---------------|
| 1              | 106895                | RULER, 30 INCH                   | 2             |
| 2              | 106893                | TRAY, 300                        | 1             |
| 4              | 106080                | WEATHERSTRIPPING                 | 32.5          |
| 5              | 106909                | SHEET, ADHESIVE, HT, 18.5 X 30.5 | 1             |
| 6              | 106252                | STRIP, PROTECTIVE                | 48            |
| 7              | 106130                | NUT, #10-32, ROUND THUMB         | 2             |
| 8              | 106892                | TABLE, APPLI-K 99                | 1             |

# **Tray Belt Idler Assy (Right Side)** 106901



**DETAIL A**

## **NOTES:**

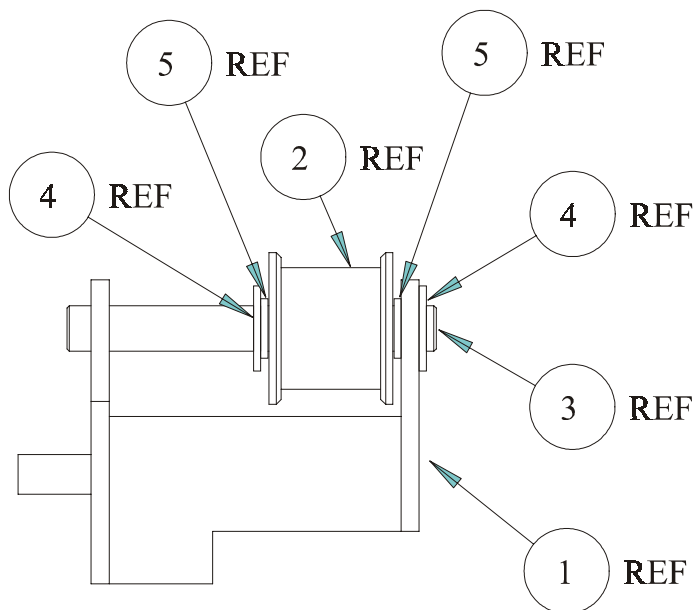
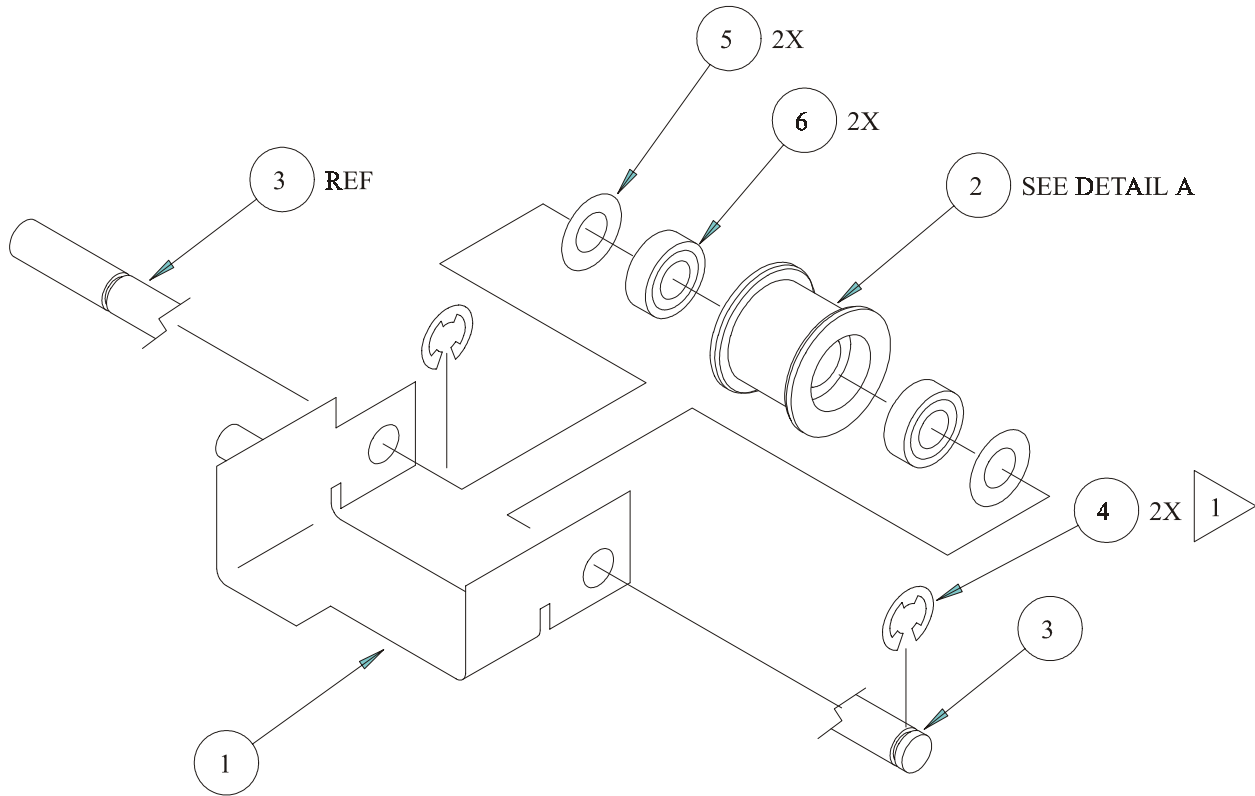
1 INSTALL THIS E-CLIP FIRST.

### Tray Belt Idler Assembly - Right side (Bill of Materials)

| Drawing Number | Component Part Number | Component Description             | Quantity Used |
|----------------|-----------------------|-----------------------------------|---------------|
| 1              | 106821                | BRACKET, IDLER, X-DRIVE, RIGHT    | 1             |
| 2              | 106890                | IDLER, X-DRIVE, APPLI-K 99        | 1             |
| 3              | 106891                | SHAFT, IDLER, X-DRIVE, APPLI-K 99 | 1             |
| 4              | 103852                | RING, RETAINING, E-CLIP, 3/16     | 2             |
| 5              | 106530                | WSHR, .195 ID, .245 OD, .03 THK   | 2             |
| 5              | 106626                | WSHR, .195 ID, .245OD, .02 THK    | 2             |
| 6              | 106896                | BEARING, .187 ID, .375 OD, .125 W | 2             |

# Tray Belt Idler Assy (Left Side)

106902



DETAIL A

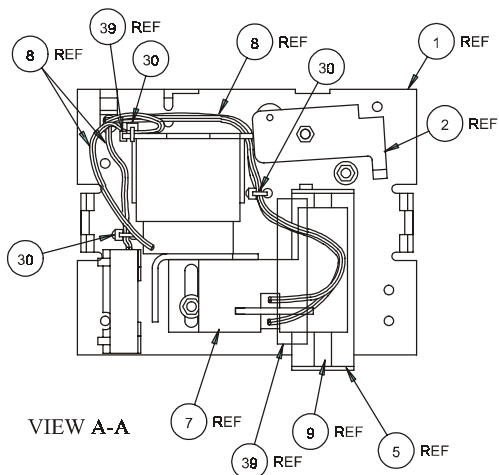
## NOTES:

- 1 INSTALL THIS E-CLIP FIRST.

### Tray Belt Idler Assembly - Left Side (Bill of Materials)

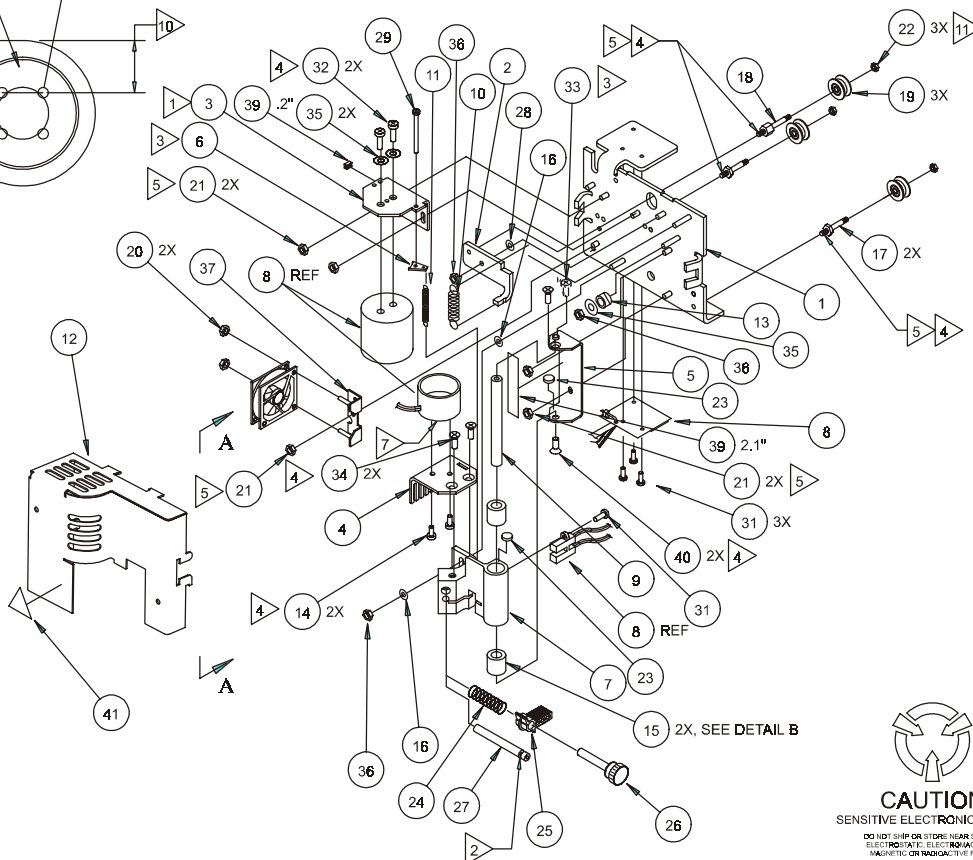
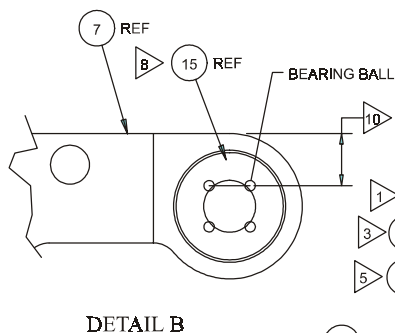
| Drawing Number | Component Part Number | Component Description             | Quantity Used |
|----------------|-----------------------|-----------------------------------|---------------|
| 1              | 106822                | BRACKET, IDLER, X-DRIVE, LEFT     | 1             |
| 2              | 106890                | IDLER, X-DRIVE, APPLI-K 99        | 1             |
| 3              | 106891                | SHAFT, IDLER, X-DRIVE, APPLI-K 99 | 1             |
| 4              | 103852                | RING, RETAINING, E-CLIP, 3/16     | 2             |
| 5              | 106530                | WSHR, .195 ID, .245 OD, .03 THK   | 2             |
| 5              | 106626                | WSHR, .195 ID, .245OD, .02 THK    | 2             |
| 6              | 106896                | BEARING, .187 ID, .375 OD, .125 W | 2             |

# Carriage Assembly 107505



## NOTES:

- 1 > SLIDE BRACKET DOWN AS NUTS ARE TIGHTEND. TIGHTEN LEFT NUT FIRST.
- 2 > SLIDE CLAMP FLANGE INTO THE GROOVE IN THE SHAFT.
- 3 > SECURE IN PLACE WITH LOCTITE 425 AFTER ADJUSTING UPSTOP AND CALIBRATING VOICE COIL SPRING SYSTEM.
- 4 > SECURE WITH LOCTITE 222.
- 5 > TORQUE TO 16 IN LB.
- 7 > APPLY THIN LAYER OF THERMAL GREASE, ITEM 38, TO UNDERSIDE OF COIL BOBBIN.
- 8 > APPLY LOCTITE 401 TO OUTER SURFACE OF BUSHING.  
CAUTION : INNER BUSHING AND SHAFT MUST BE FREE OF LOCTITE.
9. CAUTION: TO PREVENT DAMAGE TO ELECTROSTATIC SENSITIVE COMPONENTS, USE ANTI-STATIC PRECAUTIONS AND PLACE ASSEMBLED CARRIAGE IN STATIC BAG.
- 10 > ALIGN BEARING BALLS PARALLEL TO JAW, AS SHOWN DETAIL B, BEFORE PRESSING BEARINGS INTO JAW.
- 11 > WHEN PROPERLY ADJUSTED, V-WHEEL WILL NOT SLIDE ALONG THE WHEEL SHAFT, BUT WILL ROTATE SMOOTHLY.

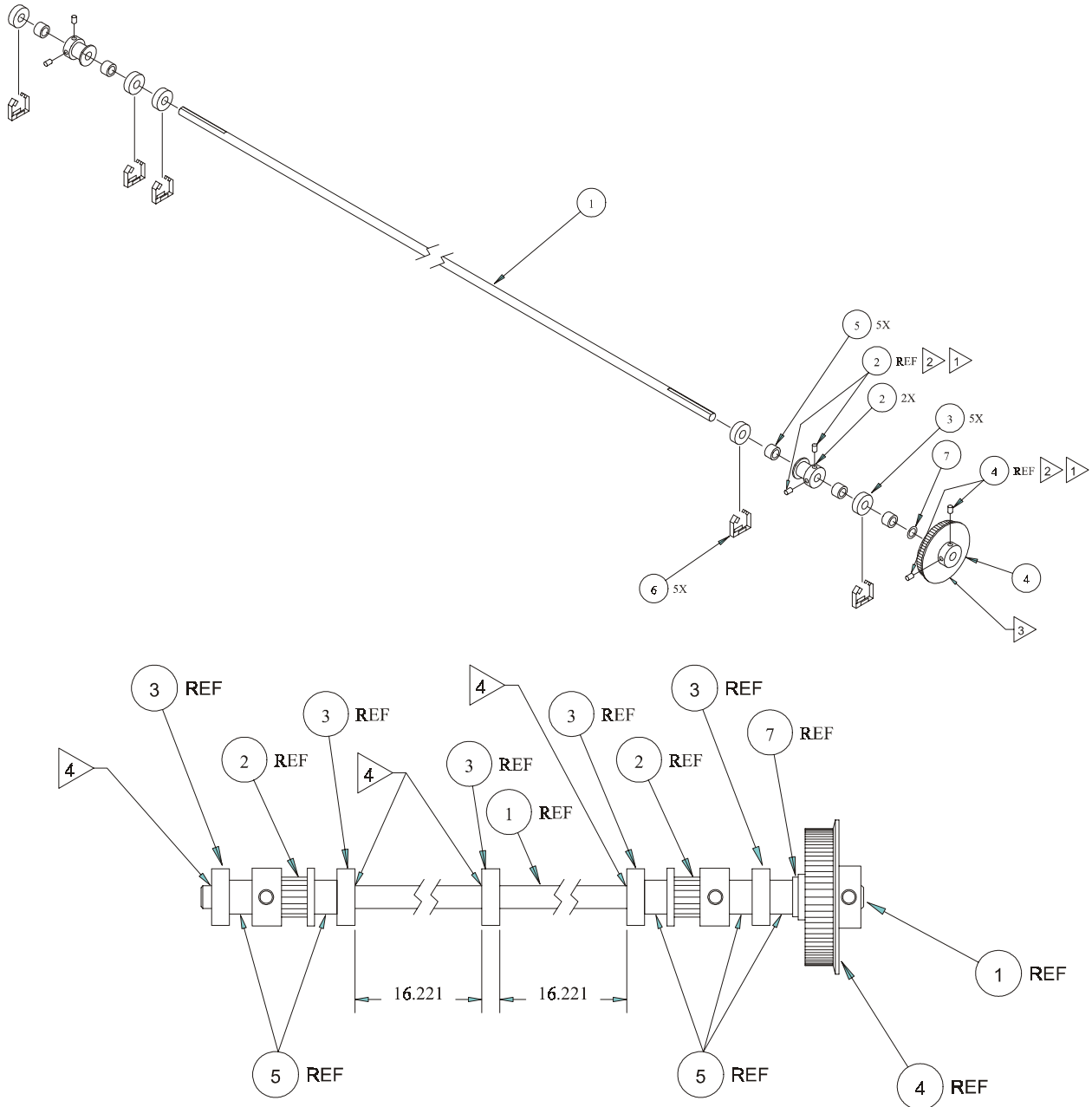


**CAUTION**  
SENSITIVE ELECTRONIC DEVICES  
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MAGNETIC OR RADIOACTIVE FIELDS

## Carriage Assembly (Bill of Materials)

| Drawing Number | Component Part Number | Component Description                | Quantity Used |
|----------------|-----------------------|--------------------------------------|---------------|
| 1              | 107487                | BASE, CARRIAGE, 350HF                | 1             |
| 2              | 107488                | ARM, V-WHEEL, CARRIAGE, 350HF        | 1             |
| 3              | 107489                | BRACKET, FIELD ASSY, CARRIAGE, 350HF | 1             |
| 4              | 107490                | PLATE, BOBBIN ASSY, CARRIAGE, 350HF  | 1             |
| 5              | 107491                | BRACKET, PIN, CARRIAGE, 350HF        | 1             |
| 6              | 107492                | PLATE, CALIBRATION, CARRIAGE, 350HF  | 1             |
| 7              | 107493                | JAW, CARRIAGE, 350HF                 | 1             |
| 8              | 107494                | PCB ASSY, CARRIAGE, 300HF            | 1             |
| 9              | 107495                | SHAFT, .250 DIA, 2.500 L             | 1             |
| 10             | 107496                | SPRING, EXT, .375OD, 1.0LG, .052D    | 1             |
| 11             | 107497                | SPRING, EXT, .188 OD, 1.0LG, .018D   | 1             |
| 12             | 107498                | COVER, CARRIAGE, 350HF               | 1             |
| 13             | 100823                | SPACER, .255ID, .38OD, .250LG        | 1             |
| 14             | 107504                | SCREW, #6-32, .250 LG, PHP, SEM      | 2             |
| 15             | 105544                | BUSHING, BALL, PREC, .25"            | 2             |
| 16             | 107502                | WSHR, .500 OD, .145 ID, .031 T, PTFE | 2             |
| 17             | 107412                | SHAFT, V-WHEEL, .187 OD, .80 LG      | 2             |
| 18             | 107413                | SHAFT, V-WHEEL, .187 OD, .93 LG      | 1             |
| 19             | 106230                | WHEEL, CARRIAGE, SC98                | 3             |
| 20             | 104011                | NUT, #4-40, KEP                      | 2             |
| 21             | 104012                | NUT, #6-32, KEP                      | 5             |
| 22             | 100089                | NUT, #8-32, HEX, NYLOCK              | 3             |
| 23             | 100705                | PAD, PEN CAP, 1/4 DIA                | 2             |
| 24             | 106621                | SPRING, COMP., .24 OD, 1.25 LG       | 1             |
| 25             | 106772                | CLAMP, PEN/KNIFE, MOLDED             | 1             |
| 26             | 106777                | SCREW, THUMB, #10-32, 1.33 LG        | 1             |
| 27             | 107014                | SHAFT, CLAMP STOP, CARRIAGE          | 1             |
| 28             | 107274                | WSHR, .5 OD, .145 ID, .010 T, PTFE   | 1             |
| 29             | 107278                | SCREW, #4-40, 1.25 LG, PHP, SS       | 1             |
| 32             | 107616                | SCREW #6-32, .312LG, PHP, SEM        | 2             |
| 33             | 107332                | SCREW, #6-32, FLAT HEAD, SOCKET      | 2             |
| 35             | 100082                | WSHR, #6, FLAT, STEEL                | 3             |
| 36             | 106532                | NUT, #6-32, HEX, NYLOCK              | 3             |
| 37             | 107503                | BRACKET, FAN, CARRIAGE, 300HF        | 1             |
| 38             | 106085                | GREASE, THERMALLY CONDUCTIVE         | 0             |
| 39             | 104471                | TAPE, UHMW, .43 WIDE                 | 2             |
| 40             | 106527                | SCREW, #6-32, .312 LG, FHP, BLK      | 2             |
| 41             | 107634                | LABEL, WARNING, EXCLAMATION, SMALL   | 1             |
| 30             | 103726                | TYRAP, .1 IN X 3 IN, BLACK           | 3             |
| 31             | 104337                | SCREW #4-40, .375 PHP, SEMS          | 4             |

# Shaft Assembly 106903



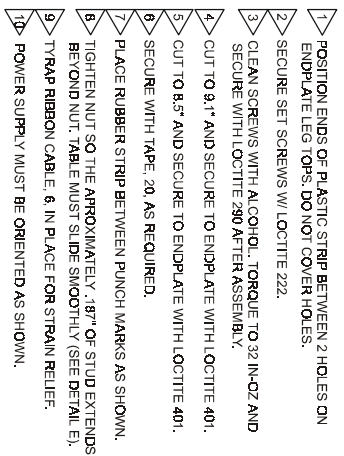
## NOTES:

- 1 INSTALL ONE SET SCREW WITH FLAT ON SHAFT.
- 2 INSTALL ALL SET SCREWS WITH LOCTITE 222.
- 3 INSTALL LABEL PRINTED WITH "P/N 106903, 300".
- 4 CLEAN BEARING INNER RACE, ITEM 3, AND GRITSHAFT PIN, ITEM 1, THOROUGHLY WITH ALCOHOL. APPLY LOCTITE 406 "PRISM" TO BOTH. CAUTION: DO NOT GET LOCTITE INSIDE BEARING.

### Shaft Assembly (Bill of Materials)

| Drawing Number | Component Part Number | Component Description              | Quantity Used |
|----------------|-----------------------|------------------------------------|---------------|
| 1              | 106898                | SHAFT, .250 OD, 37.00 LG           | 1             |
| 2              | 106908                | PULLEY, 18 X .080 X 3/8            | 2             |
| 3              | 100316                | BEARING, BALL, .25ID, .625OD, .196 | 5             |
| 4              | 105934                | PULLEY, 60T X .080 X 1/4           | 1             |
| 5              | 100823                | SPACER, .255ID, .38OD, .250LG      | 5             |
| 6              | 104820                | CLIP, BEARING                      | 5             |
| 7              | 106221                | WSHR, .25 ID, .375 OD, .03 THK     | 1             |

107622



## System 350HF - Chassis Assembly (Bill of Materials)

| Drawing Number | Component Part Number | Component Description                 | Quantity Used |
|----------------|-----------------------|---------------------------------------|---------------|
| 1              | 107046                | REAR I/O PANEL ASSY, 600H/28H         | 1             |
| 3              | 107617                | ASSY, Y-BELT, 350                     | 1             |
| 23             | 103388                | SPRING, COMPRESSION, .240 OD, .032    | 1             |
| 29             | 106714                | COVER, DUST, SC98, 30                 | 1             |
| 32             | 106813                | STRIP, TEFLON, 22.25 X .500 X.04THK   | 5             |
| 36             | 106230                | WHEEL, CARRIAGE, SC98                 | 1             |
| 37             | 107663                | TABLE ASSY, 350HF                     | 1             |
| 39             | 106897                | SHAFT, .187 OD, .77 LG                | 1             |
| 46             | 107505                | CARRIAGE ASSY, 350HF                  | 1             |
| 67             | 107817                | PCB, ASSY, 350HF, W/S-TRIG, PROG      | 1             |
| 69             | 107749                | CABLE ASSY, POWER SUPPLY, 48V         | 1             |
| 72             | 100087                | WSHR, #8, LOCK, EXT                   | 4             |
| 73             | 107734                | BRACKET, SUPPORT, TABLE, 300/350HF    | 1             |
| 74             | 100067                | SCREW #8-32, .375 LG, PHP, BLK OXI    | 4             |
| 13             | 100705                | PAD, PEN CAP, 1/4 DIA                 | 1             |
| 14             | 103026                | CONN, CABLE CLIP, .18 DIA             | 4             |
| 15             | 100026                | SCREW #6-32, .5 LG, PHP, SEMS         | 11            |
| 16             | 104013                | NUT, #8-32, KEP                       | 12            |
| 17             | 103027                | TYRAP, .1 IN X 5 3/4 LG               | 13            |
| 18             | 100279                | CONN, CABLE CLIP                      | 3             |
| 20             | 103740                | TAPE, FOAM, .5 IN, .025 THICK         | 12            |
| 21             | 104180                | SCREW, #8, .50 LG, SLF TAP, PHP, SE   | 25            |
| 22             | 104590                | SCREW #8, .50 LG, ST, FHP             | 7             |
| 27             | 106241                | WSHR #8-32, .190 ID, .416 OD, .080THK | 4             |
| 38             | 106530                | WSHR, .195 ID, .245 OD, .03 THK       | 2             |
| 44             | 103726                | TYRAP, .1 IN X 3 IN, BLACK            | 2             |
| 48             | 102726                | SETSCREW #10-32, .75 LG, STEEL        | 5             |
| 49             | 107042                | STRIP, FILLER, RUBBER                 | 3             |
| 50             | 100089                | NUT, #8-32, HEX, NYLOCK               | 9             |
| 51             | 108246                | EDGING, RUBBER, 1/8 X 9/16            | 36            |
| 61             | 106528                | TAPE, DOUBLE COATED, 1.25 W           | 2             |
| 62             | 103973                | WSHR, .170 ID, .375 OD, .035TH, SS    | 1             |
| 66             | 104717                | NUT, #10-32, HEX, NYLOCK              | 2             |
| 70             | 103726                | TYRAP, .1 IN X 3 IN, BLACK            | 1             |
| 4              | 107645                | POWER SUPPLY, 24V, 3X5                | 2             |
| 5              | 107347                | MOTOR, 5MM SHAFT, SERVO, 24V          | 1             |
| 6              | 105259                | CABLE, FLEX, 88/30                    | 1             |
| 8              | 106549                | ASSY, CABLE, MOTOR POWER, SC98        | 1             |
| 9              | 106550                | BELT, .080 X 1/4 X 100T               | 1             |
| 11             | 106817                | TRANS ASSY, Y DRIVE, 24V              | 1             |
| 12             | 107346                | PULLEY, 5MM BORE, 16T X .080 X 1/4    | 1             |
| 24             | 106665                | KEYPAD ASSY, SC98                     | 1             |
| 25             | 106708                | TENSIONER ASSY, SC98                  | 1             |
| 28             | 106713                | TRAVERSE EXTRUSION, SC98, 30          | 1             |
| 31             | 106695                | FERRITE, SPLIT, 100MHZ, .74IDX1.6L    | 1             |
| 33             | 107677                | PLATEN, APPLI-K 99                    | 1             |
| 34             | 106818                | PLATE, END, RIGHT, APPLI-K 99         | 1             |
| 35             | 106819                | PLATE, END, LEFT, APPLI-K 99          | 1             |
| 40             | 106900                | TENSIONER ASSY, APPLI-K 99            | 1             |
| 41             | 106901                | IDLER ASSY, X-DRIVE, RIGHT            | 2             |
| 42             | 106902                | IDLER ASSY, X-DRIVE, LEFT             | 2             |
| 43             | 106903                | SHAFT ASSY, APPLI-K 99                | 1             |
| 45             | 106904                | BELT ASSY, X-DRIVE                    | 2             |
| 47             | 106717                | COVER, BOTTOM, SC98, 30               | 1             |
| 65             | 107425                | BRACKET, STOP, TABLE, 200/300         | 2             |
| 68             | 107646                | PLATE, POWER SUPPLY, 3X5              | 2             |
| 71             | 107044                | SHOCK LABEL, SMALL                    | 1             |

107621



1. CUSHION CARRIAGE AT LEFT END OF PLOTTER WITH FOAM BLOCK (ITEM 11, NOT SHOWN), AND SECURE TO END OF PLOTTER WITH TYRAPS (ITEM 10, NOT SHOWN). SUPPORT CARRIAGE JAW WITH FOAM BLOCK (ITEM 11, NOT SHOWN).

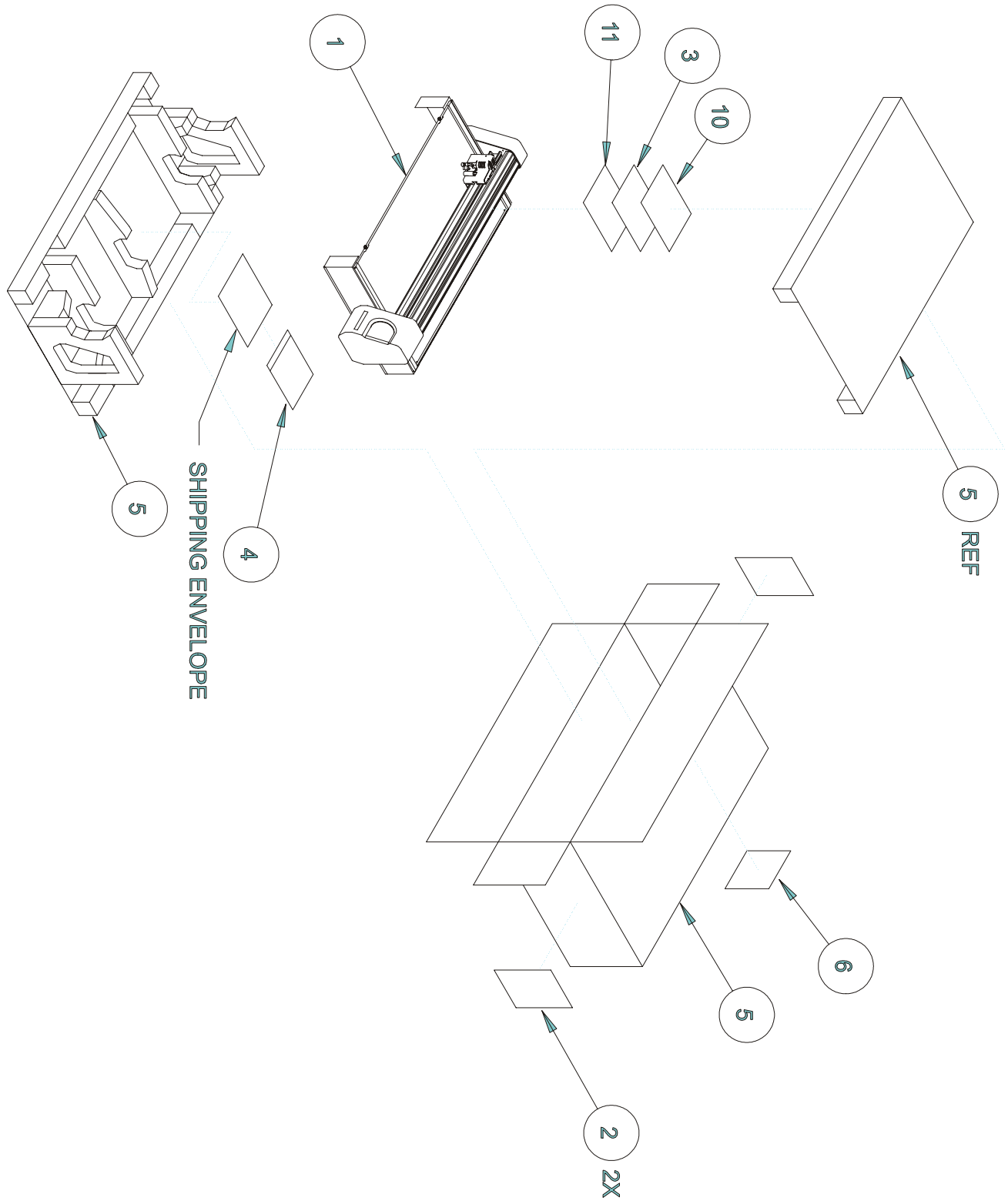
## System 350HF - Wrapping Procedure (Bill of Materials)

| Drawing Number | Component Part Number | Component Description                  | Quantity Used |
|----------------|-----------------------|----------------------------------------|---------------|
| 1              | 107622                | CHASSIS, 350HF                         | 1             |
| 2              | 106619                | COVER, RIGHT END, SC98                 | 1             |
| 3              | 106618                | COVER, LEFT END, SC98                  | 1             |
| 4              | 104926                | STANDOFF, #8-32, 5.25 LG               | 2             |
| 5              | 104725                | STANDOFF, #8-32, 1.75 LG               | 2             |
| 6              | 106241                | WSHR, #8-32, .190 ID, .416 OD, .080THK | 8             |
| 7              | 105762                | LABEL, REAR PANEL, FCC/CE              | 1             |
| 8              | 106558                | LABEL, FRONT, SC98                     | 1             |
| 9              | 101581                | SCREW #8-32, .375 FHP, BLACK           | 4             |
| 10             | 105921                | TYRAP, 28" CABLETIE NAT. NYLON         | 1             |
| 11             | 101031                | FOAM BLOCK, 2 IN X 2 IN X 2 IN         | 2             |
| 12             | 104008                | SCREW #8-32, .375 LG, PHP SEMS         | 1             |
| 13             | 100044                | SCREW #8-32, .75 PHP                   | 4             |
| 14             | 104013                | NUT, #8-32, KEP                        | 4             |
| 15             | 107076                | SHEET, ADHESIVE, HT, 18 X 30.5, 3PK    | 1             |

# System 350HF Boxing procedure

107620

**FGI Level**



## System 350HF - Boxing Procedure (Bill of Materials)

| Drawing Number | Component Part Number | Component Description               | Quantity Used |
|----------------|-----------------------|-------------------------------------|---------------|
| 1              | 106881                | WRAPPED, 300                        | 1             |
| 2              | 107072                | LABEL, SHIPPING BOX, 300            | 2             |
| 3              | 107073                | PACKING LIST, 300                   | 1             |
| 4              | 107074                | KIT, ACCESSORY, 300                 | 1             |
| 5              | 107079                | BOX, SHIPPING, 300                  | 1             |
| 6              | 107075                | BOX LABEL, UNPACKING, 300 SYSTEM    | 2             |
| 7              | 107076                | SHEET, ADHESIVE, HT, 18.5X30.5, 3PK | 1             |
| 8              | 107086                | MATERIAL, BACKING, 18X30, 1 SIDED   | 2             |
| 9              | 107088                | MATERIAL, BACKING, 18X30, 2-SIDED   | 2             |
| 10             | 100278                | TYRAP, .15 IN X 9 IN                | 4             |
| 10             | 107077                | GUIDE, QUICK START, 200/300         | 1             |



## Service Bulletins

### Installation Error/301 Software

This bulletin pertains to versions 9-17 or higher of the Ioline 301 Software that do not install successfully.

Error Message: "could not install to C:\windows or c:\windows\system"

Error Message: "a required file, MSVBVM50.dll was not found".

1. Make sure that any virus-checking program (that might prevent writing to the Windows system area) is disabled.
2. Close all Windows application programs.
3. Using Windows Explorer, make sure that Windows is installed in the standard directory C:\windows\system. If not, note the Windows path for use in step 7.
4. If you have not already done so, copy the attached programs WSUP.EXE and WSUPE.EXE to a diskette. Use these diskettes for steps 5 and 6.
5. Place the disk with WSUP in drive A. Click on the Windows "Start" button, then click on "Run". Enter the following path into the "Open" field A:\WSUP. Click the Unzip button.
6. Place the disk with WSUPE in drive A. Click on the Windows "Start" button, then click on "Run". Enter the following path into the "Open" field A:\WSUPE.
7. If Windows was found in a nonstandard location, enter that location in the box when prompted "Unzip to Folder". If Windows is in the standard location, leave the entry I "Unzip to Folder" as is.
8. Click the Unzip button.
9. Reboot system.
10. Click on the 301-software icon. If any error messages are displayed, write them down and call Ioline Technical Support.



## Creating Barudin Files/301 Software

Barudin files can be created in several different formats:

1. The Ioline Bridge/301 software reads Barudin .DAT files on DOS diskettes
2. If a customer can only create Barudin FMC diskettes, which are a CPM format disk, the customer must convert these by means of a conversion utility such as the one available from Sydex (541) 683-6033. It is called the "Barudin Only" version of "22 disks", and costs \$50.00. It runs on DOS not Windows and will read an FMC disk and create .DAT files on a DOS disk.
3. If a customer can only create Barudin FDR diskettes, there is no conversion path. The customer must replace his software with software that creates disks that are Barudin DOS, Tajima DOS, etc.

## Run Time Error Codes/301 Software

Run-time error #5 – "Invalid Procedure Call"

Occurs only when the file name you are exporting exceeds 16 characters (prefix), and export in Tajima format. Other formats are not affected. To solve, rename the file to something less than 16 characters, then import into the design view of the 301 software and export in Tajima format as normal.

Run-time error #6 - "Overflow"

Occurs when a design is imported into the design view containing coordinates greater than 32,760. This is never a problem with designs appropriate for embroidery (rarely coordinates greater than 15,000). However, there are plot (.plt) designs that do contain larger coordinates (for sign cutters, etc.). This error should not occur when running 301 version 02-4 or higher on Win 95/98. However it will occur with Windows NT and 2000. Beta version 02-7 solves the problem (301CD8-1.exe and 301CD8-2.exe).

Run-time error #13 – "Type Mismatch"

Unknown circumstances.

Run-time error #57 – "Device I/O"

Involves Printer or Serial Port. Usually this error will be trapped within 301, but sometimes not.

Run-time error #75 – "Path/File Access Error"

File location or path does not exist.

".DLL Not Found" or "Procedure in .DLL Not Found"

Occurs if a .dll file was not properly installed. Verify Hardlock.vxd (Win95/98) Hardlock.sys (Windows NT), IolineLPT.dll and Tiffw32.dll exist in either C:\windows\system or C:\winnt\system folder.

"Error 1003 - Internal Error"

Hard-Lock (Dongle) not plugged in.

## Stitches Overlap to Wrong Side / 301 Software

Occurs most often when converting an 'outline' which is from an embroidery file (versus outlines generated from Corel Draw or the like). This is because the stitch segments are small and more irregular. Also, when a portion of the outline overlaps, the algorithm gets confused. Best results occur when there is no overlapping or doubling of outline segments.

See the "301 User Guide" for the most up to date information concerning the 301 software.

## How to “KISS-CUT”

Kiss cutting is the process of cutting through one layer of a stack of material and not cutting through the layer(s) below. Typically the upper layer(s) has a pressure sensitive backside which adheres to the lower layer of material.

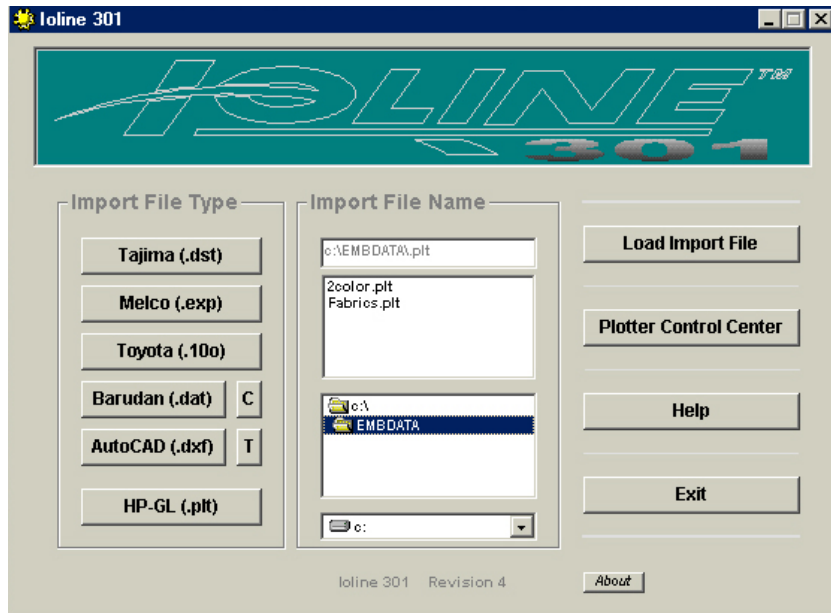
Kiss cutting creates more scrap material for the upper layer(s), (compared to cutting individual layers and hand placing them on the lower layers) but can result in a considerable time savings since multiple layers do not need to be aligned and the placement stitch for the upper layer may be eliminated from the embroidery process.

1. Place Background material onto adhesive sheet and smooth it flat. Place the foreground material on top of the background material making sure the sticky side is down.
2. Load Blade Holder into Carriage Jaw.
3. Adjust Blade Holder as described in the quick start guide. (Test with single button test cut.) Adjust blade exposure and cutting force so that only the material is cut. Adhesive sheet may be scored lightly.

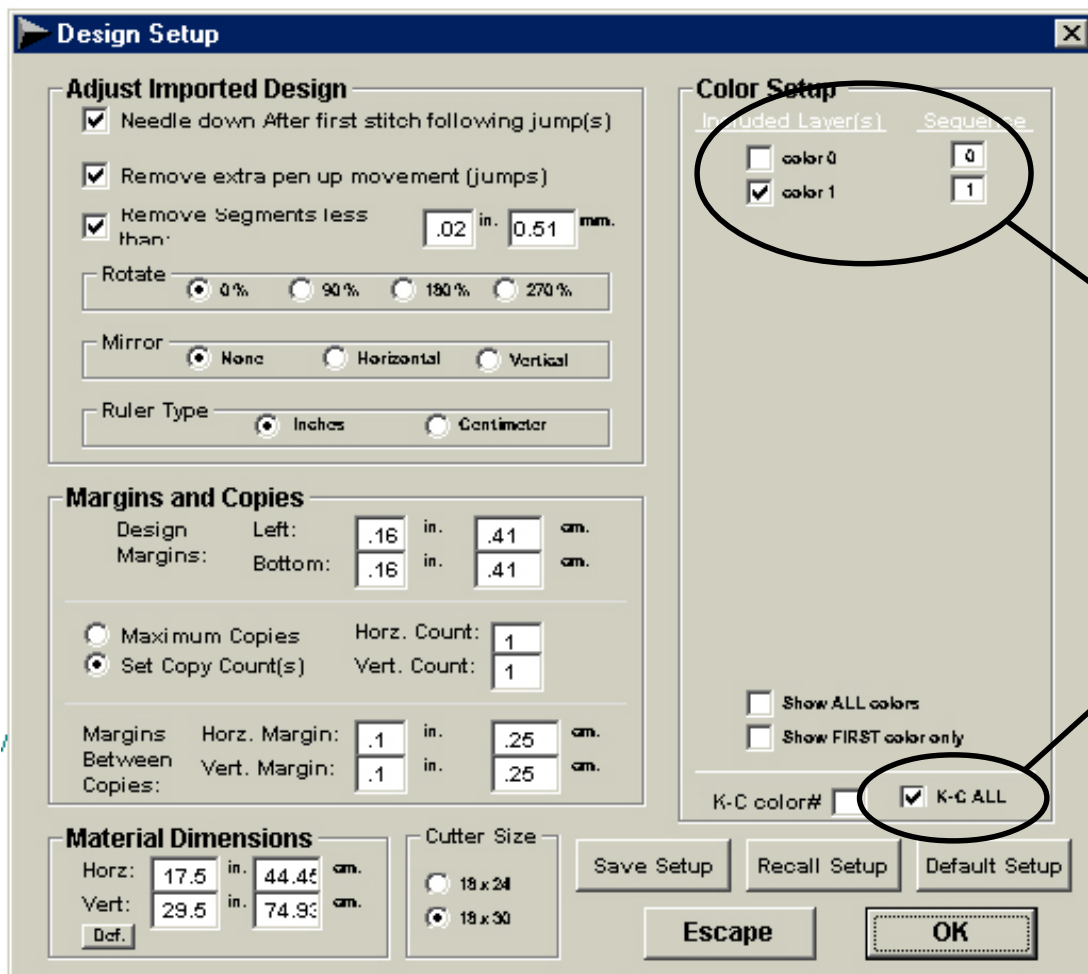
Note: It is recommended that the materials are of similar type and thickness so the blade does not need readjustment.

4. Once blade is adjusted, use the Keypad Arrow keys to position the Table and Carriage so that the Blade Holder is over the lower right corner of the material (lower left origin of plot file).
5. Press Set Origin on the Keypad to obtain a green Keypad light.
6. Open the 301 software.
7. Select the directory and file you wish to open (See “301 Main Window” on the next page). Double click on the file or select the file and click on Load Import File.
8. Select Design Setup.
9. Under the Color Setup heading, select K-C ALL (Kiss Cut All). (See “Design Setup” window on the next page)
10. Under the Color Setup heading, select the color that corresponds to the “Top” layer of the design to be cut. This should be the profile with the Smallest perimeter. (See “Design setup” window on the next page)
11. Select OK.
12. Select Send to Cutter.
13. Select OK.
14. When the first cut is done, press the Start/Stop button (the light should turn “Red”) and move the tray forward. Weed away the excess material around the top letter.
15. Press Start/Stop button on the cutters keypad, the light should turn back to green, and the tray and head will move back to the original starting point.
16. Under the Color Setup heading, select the color that corresponds to the next layer of the design to be cut and deselect the color that was just cut. This profile should have a larger perimeter than the one previously cut.
17. Select OK.
18. Select Send to Cutter.
19. After it has finished cutting, weed away the excess material.

Note: As an alternative method, you can also cut the pieces in reverse order. For example, cut out the background piece(s) first, then lay the top piece of fabric on and cut those pieces out. This method allows you to cut a whole tray of Kiss-Cuts, and weed the two pieces of fabric together.



301 "Main" Window



Ioline 301 "Design Setup" Window